NATURE MAGAZINE

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JANUARY 1929 35¢ VOL. 13, NO. 1.

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Organized to Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

THE reception accorded *The Nature and Science Education Review*, published in the interest of Nature Education by Mr. Arthur Newton Pack, President of the American Nature Association, has been most enthusiastic. As announced in the first issue of this publication, its continuance depends upon the active support of those in the field. For the benefit of any educators in the field of Nature Study or Science who have overlooked previous announcement of this publication may we state that a few copies of the first issue are still available and will be sent to any interested, on request. The first mailing was sent to a list of about twenty-five hundred, but inevitably some whom we would have wished to reach were overlooked.

* * *

Interest is widening, with the growth in national publicity and adoption of the project by various organizations, in the American Nature Association's National Flower Poll. A ballot for the use of individuals and organizations interested is printed elsewhere in this publication as well as a report of progress to date. The American Nature Association wishes to emphasize that it is furthering this project with the primary wish to stimulate interest in and knowledge of wild flowers and to accomplish an educational result. It does not feel that the fate of a Nation depends upon the selection of a National Flower, but it does feel that appreciation of flowers and stimulation of interest in their protection and perpetuation, warrant such a poll. A special printing has been made of a bulletin designed to be of assistance to teachers and organization leaders in furthering interest in the poll, and copies will be sent in limited number and in a discretionary way to those who write in to the National Flower Editor.

* * *

By the time this issue of Nature Magazine is in circulation our Director of Wild Life Conservation, Mr. William L. Finley, will be in the East on a lecture tour. His motion picture films this year contain some of the most remarkable material on mountain goat, beaver, mountain sheep and other wild life of our western National Parks ever filmed. These films were taken during the expedition of the American Nature Association under the direction of Mr. Pack and Mr. Finley, and have been enthusiastically acclaimed wherever they have been shown.

* * *

Judging by the widespread approval and letters of appreciation received, the American Nature Association has made a distinct contribution to Nature Education in making available the book of "Bird and Animal Paintings" by R. Bruce Horsfall. Nowhere else can be obtained in such convenient form so many colored pictures with correlative informational matter as are contained in this book which covers one hundred and sixty-eight different subjects. Additional description of this book is to be found in the advertising columns of this issue for the information of new members and those who may not have seen previous announcement of the book.

* * *

The American Nature Association is co-operating with the American Nature Study Society in connection with the annual meeting of that Society held in conjunction with the annual convention of the American Society for the Advancement of Science.

* * *

Since this issue of Nature Magazine inaugurates a new year it is appropriate to say the American Nature Association plans to conduct with renewed activity its campaign in the interest of billboard restriction and the stimulation of Outdoor Good Manners. We will be pleased to receive reports from anywhere in the country where things have been accomplished in these two directions in order that we may pass the word of accomplishment on to others who are working in the same directions. Undoubtedly, many of our members read the excellent article by Kenneth L. Roberts in a recent issue of the *Saturday Evening Post* entitled "Travels in Billboardia." This ably sets forth the problem and indicates the widespread and growing interest in preserving our scenery for scenery and not dedicating it to sites for marring billboards.

* * *

With its pictures in color, its large number of illustrations and other physical details, Nature Magazine is an extremely expensive magazine to print. The support received from annual membership subscriptions will not of itself sustain it. It must depend in part upon revenue from its advertising columns and by virtue of its character is unable to accept certain classes of advertising such as guns and ammunition, cigarette advertising and the class of "cheap advertising." The support of our readers is earnestly solicited in patronizing the advertisers in Nature Magazine upon whom they can rely, and in this connection attention is called to the inclusion in each issue from now on of an index to advertising. Please patronize Nature Magazine's advertisers and tell them what medium it was that brought their product to your attention. This will make possible further changes and improvement in Nature Magazine and will redound to the benefit of our readers, since Nature Magazine is not published for profit.

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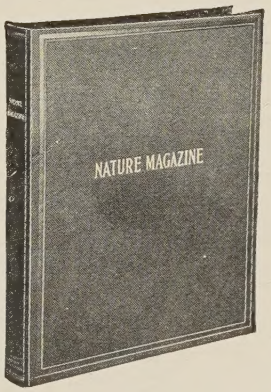

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JANUARY 1 TO APRIL 1, 1929

All who have seen the Finley pictures in the past will agree that these pictures are the best yet.

You who have read the story of the expedition, appearing in Nature Magazine for January, February, March, July and September, 1928, will be more than ever eager to see these pictures and hear Mr. Finley.

Rocky Mountain Goats—outwitted by the use of a goat disguise, photographed within 50 feet.
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LIBRARIAN IVI

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You will help Nature Magazine to grow by Answering the Advertisements.

More cruises by steamer will start from New York this winter than ever before. There will be no less than sixty to Central America and the West Indies and over 18,000 tourists will take them. Over 7,000 people will go on eighteen cruises to the Mediterranean and it is estimated that close to 2,000 will take the four round-the-world trips, and about 400 a cruise around Africa. It is estimated that $3,600,000 will be spent by the tourists, while eighty-three steamships will be used in the tours.

* * *

The White Star Line announces reconditioning of the big liners, the Majestic, Olympic, and Homeric, to all of which will be added a number of suites with private baths in answer to the steadily increasing demand for such accommodations.

* * *

The Ward Line has announced its schedule of winter trips between New York and Havana and also between New York and Progreso and Vera Cruz. The steamers run on a regular schedule and dates of sailing and prices of trips may be had on application.

* * *

The Santa Fe Railroad is announcing mid-winter escorted tours, all expenses paid,

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A recital of bird and animal calls precedes the lectures—135 programs given last season. "The most beautiful program we have ever had" is the usual comment.

During the summer Mr. Caldwell conducts nature camps for boys and for women in the Rocky Mountain National Park, Colo. Ask for folders.

AMERICAN NATURE ASSOCIATION

15 Boudinot St. Princeton, N. J.

CAMERA TROPHIES 1928

SPEAKING of adventures—we were bent on taking motion pictures of those wild red foxes 'way over back of farmer Alvord's place, but what a battle of wits we got into! The old lady moved her cubs three times. Twice we were able to follow—then she lost us. Two weeks of work and 180 feet of film—but what film!

Then I perched three hours 60 feet up a sugar maple, concealed under my "magic carpet" blind, and took rarest shot of red-tailed hawk arriving home, mouse dangling from her beak like a princess's earring!

Also this season, up in Nova Scotia, I captured the shy minister gull on my motion picture film, and intimate camera interviews have I had with the osprey.

These **trophies** will be added to the already rich material included in my illustrated platform lecture—**Wild Life Adventures**—a favorite among schools and, I am told, an inspiration to students and teachers alike.

There are other subjects, too, including **Cruising the Canadian Labrador**, a pictorial story about the now famous Greenely Island country.

(Note: Fall and early winter will be spent in the east. In January 1929 I go to the middle west.)

Let me send you an illustrated circular.

Howard H. Cleaves

American Nature Association

15 Boudinot St., Princeton, N. J.

to California by way of Grand Canyon, Phoenix, Arizona and Los Angeles. These tours offer a maximum of sight-seeing and, a maximum of travel comfort. Side trips may also be made to the Yosemite and other interesting points.

* * *

Havana offers many attractions to the winter tourist. The racing season at Oriente Park was inaugurated on December 8 and continues for ninety days. The carnival days are on various Sundays in January and February, and there is an official reception to the Carnival Queen and her Court on January 20. Havana is now well named the Monte Carlo of America.

* * *

The United Fruit Company, famous for its great white fleet, announces weekly cruises to the Caribbean at a cost of $315 upward including all expenses. These are ideal trips on steamers especially built for traveling in the tropics.

* * *

Surprisingly low prices are made for Mediterranean trips by the White Star Line, which announces forty-six day cruises to the Mediterranean, the Holy Land and Egypt at $395 upwards including shore expenses. These trips are on January 10, January 19, February 28 and March 29.

* * *

The Cunard Line is to run a series of Havana Tours this year, one nine day trip at $175 upward, and a thirteen day trip at $210 upward. The tours include hotel accommodations in Havana and sight-seeing trips.

* * *

The Los Angeles Steamship Company is now conducting a cruise around South and Central America and the business possibilities as well as the social pleasures of such a cruise have been found sufficient to justify the company in making this cruise an annual affair. On the cruise are over thirty prominent business men of the Pacific Coast who are directly interested in economic problems of the different countries on the itinerary.

* * *

The Merchants & Miners Transportation Company, headquarters at Baltimore, will conduct a Christmas Tour from Baltimore and Philadelphia to Jacksonville, St. Augustine, Daytona and Ormond Beach, leaving on December 21 for a period of nine days, with all expenses paid. The price is $97.00. This will include sight-seeing trips at Daytona and Ormond Beach and Jacksonville.

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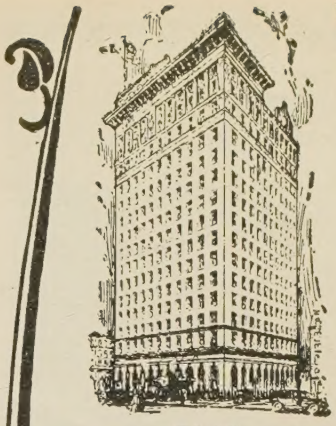

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The Cunard Line announces twenty cruises all over the world for the present season. These include a Round-the-World Trip, Havana weekly service, trips to the West Indies, trips to the Mediterranean, others to the Mediterranean and North Cape, and one around Africa.

* * *

Much interest is being aroused by the Raymond and Whitcomb Land Cruises to California and return. These winter tours are a new and a very interesting feature of travel in the United States.

* * *

To supplement further its interpretation and tourist service abroad, the American Express Travel Department has instituted a similar service in several of the ports of entry in the United States as a convenience to travellers arriving in, or departing from, the states.

* * *

The steamship Rotterdam of the Holland American Line will make its eighth Mediterranean cruise this winter, sailing from New York on February 7 to go to the Madeira Islands, Morocco, Spain, Algeria, Tunisia, Italy, Greece, Turkey, Palestine, the Holy Land, Syria, Egypt, Jugoslavia, Monaco, France and Holland. There are optional trips to various places en route.

* * *

New booklets have been issued by the American Express Company announcing a series of all-paid, personally conducted tours in Europe, covering practically all worth-while spots in Europe of interest to a traveller.

* * *

Johannesburg, the center of the gold production of the world and the largest city of South Africa, is hospitality itself to the visitor. During a space of thirty-five years, there has risen on the site of a mining camp this magnificent city, resplendent with architecturally correct public buildings and hotels of modern convenience. On Sundays, when the mines are closed to working, thousands of native employees revert to savage type and stage for the entertainment of visitors the thrilling war dances for which Johannesburg is so famous.

* * *

The East Michigan Tourist Association, Bay City, Michigan, announces that East Michigan, the four-season playground, is now preparing for the entertainment of winter outdoor sports enthusiasts. Grayling and Gaylord, two communities which have developed winter sports programs, are preparing for their winter guests. Greenbush Inn, on the shores of Lake Huron, possessing every equipment and requirement for an exhaustive winter sports program, is now entertaining winter guests. Further information regarding winter sports in East Michigan may be secured by writing the East Michigan Tourist Association, Bay City, Michigan.

Membership Nomination Blank

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solves many mysteries of animal ways and causes the reader to yearn longingly to collect all these "children of the woods" from our forests and place them in our own back-yards to play with.

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YOUR BODY
How It Is Made
How It Works

What could be more vital, more fascinating than a series of brilliantly-written articles about the human body? Twelve articles on this absorbing topic will appear in HYGEIA, The Health Magazine during 1929. Here, in language that is easy to understand, you can have a complete book on anatomy, written by Dr. B. C. H. Harvey of Rush Medical College. From the first article on the skin to the last about the feet, you will surely want to get every bit of this "course" on the human body.

Our Idiosyncrasies to Food

Why is it that some persons can't eat strawberries and that shell fish cause others to break out in a rash? Read the answer in the January HYGEIA. Dr. W. W. Duke explains that almost any food may cause hives, hayfever, asthma, and eczema in certain individuals.

Are High Heels Harmful?

The women who patter along on spike heels —and most of them do!—are they injuring their health. This HYGEIA feature shows how the health and foot structure compare in two groups of college girls, one wearing high heels and the other low.

The January HYGEIA is packed with other wonderful health features: *Parents' Mistakes, A Physical and Mental Tonic, Turpentine Poisoning, Unkinking the Mind, Shingles, The Child Who Won't Drink Milk,* and Answers to Health Questions. HYGEIA'S regular rate is $3.00 a year, but here is an unusual introductory offer.

6 Months for $1.00!

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535 N. Dearborn St., Chicago

Please send me HYGEIA for 6 months, beginning with the January issue. I am enclosing $1.00 in payment.

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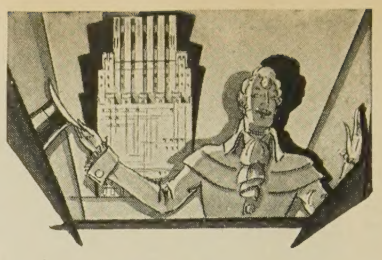
The Battle

Nature is not always as peaceful as one of Wordsworth's poems, and its struggles are many times to the death; but a battle between a crayfish and a water snake, witnessed by A. B. Grubs of Cripple Creek, Virginia, ended in a draw. When he saw them first, he writes, the two were straining underwater to dispossess each other of a bit of food, while the fish was holding to the snake's tail, which was curved around him, for support. Finally the pincers the crayfish had been using effectively slipped, the snake gobbled the food, and his opponent tried then to get it back by grabbing the snake by the upper lip, and holding fast. The snake could not pull him loose; he wiggled and writhed to no avail. But finally he started for dry land—for the battle had been under water—and as soon as his head struck the shore, the crayfish let go. He did not like the prospect of an overland tour. Like a flash the snake turned for the water again, free of his tormentor, and the fish made one last grab for him but missed. "It was a vanquished and abashed snake that swam away —he had got the food, but his suffering had made him pay dear."

Flowers in Alaska

Those who live in Alaska need not fear this northern territory for lack of winter flowers or cultivated plants, since the hardy flowering bulbs—narcissus, tulip, English iris, gladiolus and others,—can be propagated on a commercial scale there, the U. S. Department of Agriculture advises. Flower lovers are counselled to grow their own bulbs where possible, and Circular No. 2. of the Alaska Experiment Stations, which may be obtained on request from the department in Washington, will furnish all the necessary information.



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My choice of flower to be designated as National Flower is

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IF A CLUB OR SCHOOL, PLEASE INDICATE BELOW FLOWERS RECEIVING FIRST, SECOND, AND THIRD LARGEST NUMBER OF VOTES.

First Choice.....**No. Votes**.....

Second Choice.....**No. Votes**.....

Third Choice.....**No. Votes**.....

(Signature or name of school or club).....

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(City and State).....

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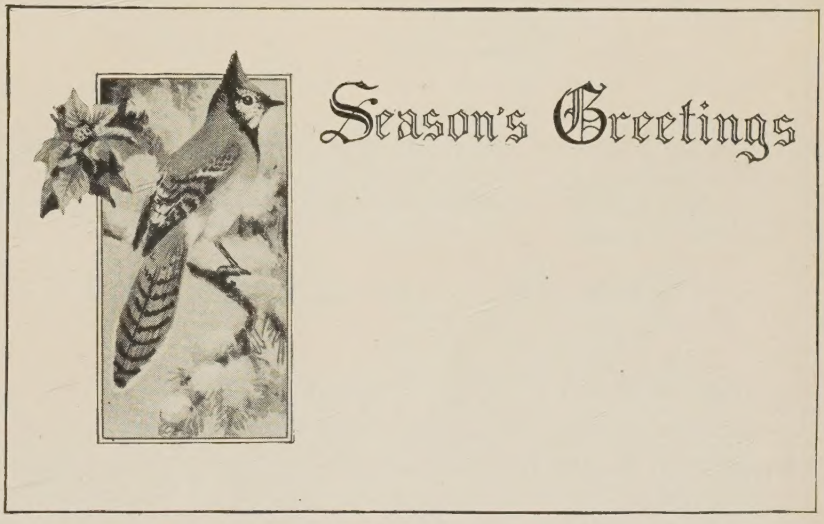

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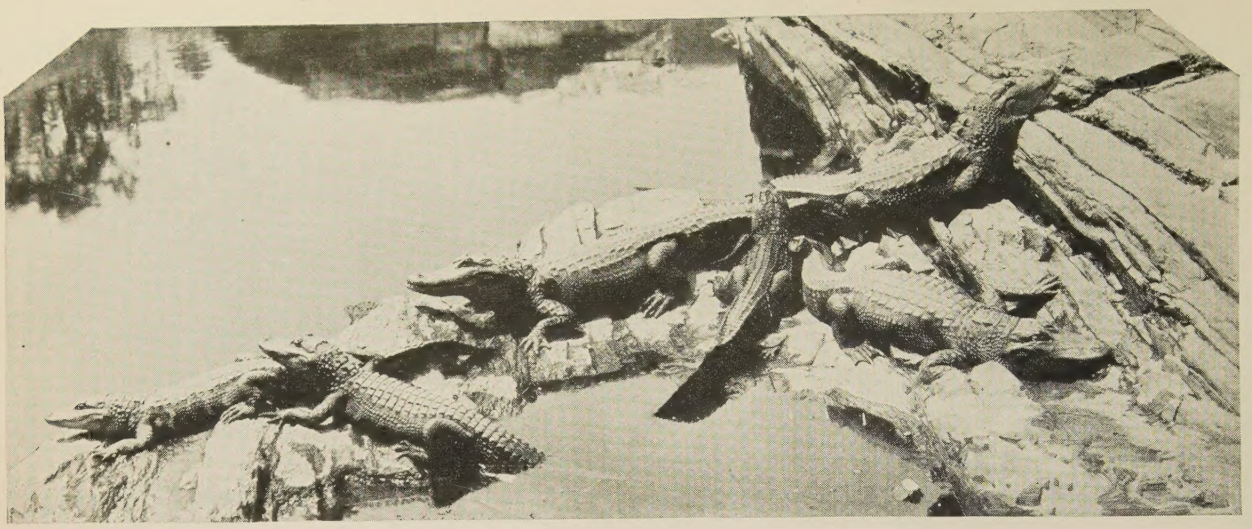

JUST SOAKING UP THE ULTRA VIOLET UNDER A TROPIC SUN

NATURE MAGAZINE

PUBLISHED BY

THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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NATURE CALENDAR

JANUARY

by E. Laurence Palmer

At the beginning of the year most of us start things with a new calendar. To all people, however, the new year does not begin on what most of us consider as January 1. In Greece, it begins on what we know as January 13; in Persia, on March 21 and in ancient Rome it began in March. Members of the Jewish faith start their new year on September 23. Not only do humans disagree as to when the new year arrives but they also disagree as to what year it is. The cover on this magazine bears the number 1929 for the first time; a certain Jewish house of worship being erected as this article is written bears the date 5688, since the Jews date their time from the supposed birthday of Adam.

Yet while men differ as to the year, old Father Time continues about his business. While we can see neither him nor his scythe, we can recognize many records that Mother Nature has left which mark the yearly units. Almost any woody plant within our reach shows the place where the growth began last spring and the spring before that. Our wooden floors and table show streaks made by the alternating spring and summer wood of many years and old stumps always challenge our interest concerning the age of the trees which produced them.

Should we get the spirit of competition and endeavor to determine who can find the oldest living thing we will have an interesting time. For years America, the land where Ponce de Leon sought the fountain of youth, held the record of being the home of the oldest living things. Possibly that record is still held by our continent, since a cypress, the Big Tree of Tule, 250 miles southeast of the City of Mexico, has an estimated age of at least 5,000 years, thus putting the redwoods of the United States figuratively in the shade by a number of hundred years. This tree has a trunk diameter of fifty feet, or one fourteen feet larger than the largest redwood.

If the discoveries recently announced by Charles B. Lipman of the University of California bear the scrutiny of further investigation, however, our cypresses and redwoods may easily be classed among the younger living things to be found on the earth. Lipman has announced that he has found living organisms in Pre-Cambrian rocks taken from the Grand Canyon of the Colorado and from Canada, and other living organisms from Pliocene rocks collected several hundred feet below the normal surface of the earth. If the evidence indicates that these organisms have been living even in the spore form in these rocks we cannot even conjecture how many thousands or millions of years old they are. The coming year will unquestionably give us new clues as to the relation of these organisms to the development of the earth.

Without going back so far, however, we may all see how things about us "show their age".

Our amateur detective powers may enable us to judge a great variety of things on which Time has engraved his marks deeply or superficially. Some slight change has been effected in every thing.

So let me suggest, since January begins a new year for many of us, that we look about for signs of youth and of old age. Let us recognize a place for both. If the year started in March or September, it would be as happy because of the opportunities it will offer everyone to know more about this perennially interesting world in which we live.

IN THE TROPIC JUNGLE

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NATURE MAGAZINE

Volume Thirteen
No. One

January, 1929

SUNSET GLOWS OVER TROPIC WATERS
There is a mysterious charm that hovers over tropic seas and islands to the south

ALONG CARIBBEAN SHORES

Why Do the Tropics Lure Those Who Know Them?

by Tom Gill

He shivered as the north wind whipped about the afterdeck and whined above us in the ship's wireless. Every line of his spare figure was a mute protest against the cold and gloom of the harbor. Plunging his hands still deeper into the closely buttoned overcoat he shook his head.

"Four o'clock." His very voice seemed chilled and faint above the violence of the gathering storm. "Four o'clock, and dark already. Lord, what a city!"

Accusingly he pointed toward the towering buildings across the river, with their myriad lighted windows gleaming and glittering down long, canyon-like streets, that receded and lost themselves at last in the twilight.

"You don't like New York?"

"Not now—not in winter. Spring and autumn it's a wonderful city—wonderful. But not winter. Short, dark days, sleet, cold—". His voice faded into a chilly silence and once more he shook his head. He gazed toward the darkening city.

For the moment he typified all that portion of humanity that instinctively seeks warmth and sunshine.

"You're going to the tropics, then?" I asked.

It was a foolish question after all, since everyone of us aboard that little boat would be bound for the tropics within an hour.

He smiled—it was his first smile—and his eyes held a look of anticipation.

"In six days," he told me, "I'll be shooting eighteen holes of golf where flowers are blooming and a man don't have to wear four sweaters and a pair of earmuffs. I'll be trolling for barracuda and bass, or just lying on a warm, sandy beach, sopping up sunshine."

I could see he was launched now on a subject dear to his heart.

"One thing I'll never understand, if I live to be a hundred," he went on, "and that's why people go flocking

Mr. Gill, Forester of the Charles Lathrop Pack Forestry Trust, knows the tropics. In cooperation with the Tropical Plant Research Foundation, he spends half of each year in southern climes in an intensive study of the tree resources of the countries which border the Caribbean Sea.

U. S. ARMY AIR CORPS

THE "LONE EAGLE" TOURS THE AMERICAS
Colonel Lindbergh trying out a plane over Gatun Lake in the Canal Zone

off to Europe year after year, when close at hand is a real playground and wonderland. Funny! After all, what are Paris, London and Berlin, but New York over again? Same clang of autos and street cars, same beastly fogs. Habit, I suppose. Ever been to the tropics?"

I nodded. "Several times."

"They're different, aren't they? Different from any place in the world. They have—" he paused, searching for a word,—"They have a charm," he concluded uncertainly, as if not fully satisfied with the word he had found.

Yes, he was right. There is a charm. In the tropics, as nowhere else, there is a sense of escape from the all too familiar world we live in. "It's an elusive kind of spell, isn't it? Something you can't put your hand on—but something that gets you and brings you back. Just what is it?"

I shook my head. The silence that followed was broken by the long warning blast of the steamer's whistle—the signal for the gangplank. Again the gale pounced down upon us, and drove us forward to the shelter of a smokestack.

And we stood there in the early twilight of the harbor listening to the little sounds that came up from the deck below—the calls of farewell in English and Spanish and in sing-song Haitian French, until a few whirling flakes of snow stung our faces and we went inside the cabin.

As I lay in my berth that night I thought again of that talk on the afterdeck and I wondered if one might unravel the mystery of this charm that hovers over those tropical seas and islands to the south. I puzzled over it later as we ploughed through the long swell of the Caribbean, while before us, little schools of flying fish darted and skimmed over the quiet waves, then plunged suddenly and were gone. And I thought of it still again as we lay at anchor in the sleepy harbor of Port au Prince, while the sun turned sky and water to living fire as it sank over the far-off mysterious island of Gonave.

For after all how does one put that spell into words? It speaks a different language to each one. It is a spell of various meanings and multitudinous appeal. And it goes, I think, a great deal deeper than the color and strangeness and newness of it all. It goes back further than the golf links and fishing my friend talked of. Back to something very fundamental, to some quality that in the childhood of the race was necessary to life itself, and without which even in these days we find ourselves discordant and dissatisfied.

For one thing the tropics is the cradle of all life. All humanity is, to some degree, like my little man of the afterdeck. There comes a time when we long to get away for some respite, however brief, from the long battle against winter. We love sunshine and warmth. We welcome spring with its long, lazy afternoons and its flowers. It is part of our very nature to want these things. The kindness of warm, mellow days and balmy nights. And it is because the tropics have been able to give these things from time immemorial that life there is more abundant.

The great abundance of life. That is the first thought one has when first he visits some tropical island or some low coast town along the South American shore. Life crowds about him. Not human life alone, although the tropics is the most densely inhabited part of the earth's surface, but every form of life. The air above is made musical by the call of birds and the blue waters beneath teem with many colored fish that dart about with incredible rapidity like little dabs of bright paint, grown suddenly animate.

And in the world of plants, life shows the same profligacy. Back in the jungles an impenetrable mass of trees, vines, and lesser plants are all striving for the sunlight, all filled with Nature's great ambition—to grow and flourish. Life is so crowded here that it has formed itself into a series of horizontal layers. Above

Palms that the Wind makes articulate.
Lagoons where the Sunlight plays.
Turquoise Beaches that reach back to the impenetrable Jungle.

(Above) MAKING A PANAMA HAT

Not all come from Panama because these happen to be Santo Domingan natives at work

are the tallest of the trees among whose great spreading branches, ferns and mosses and exquisitely delicate orchids find habitation. Below are the lesser growths—the trees that, unable to reach the light, must somehow endure the shade—the shrubs, the ground mosses and low palms.

And even below these, down on the very forest floor where the sun's rays never fall, here is still another world of life. A world of burrowing and creeping things—ants, beetles, green and bronze lizards, long slender snakes, infinitely graceful and wary pursuing their unhurried way over the leaf mold.

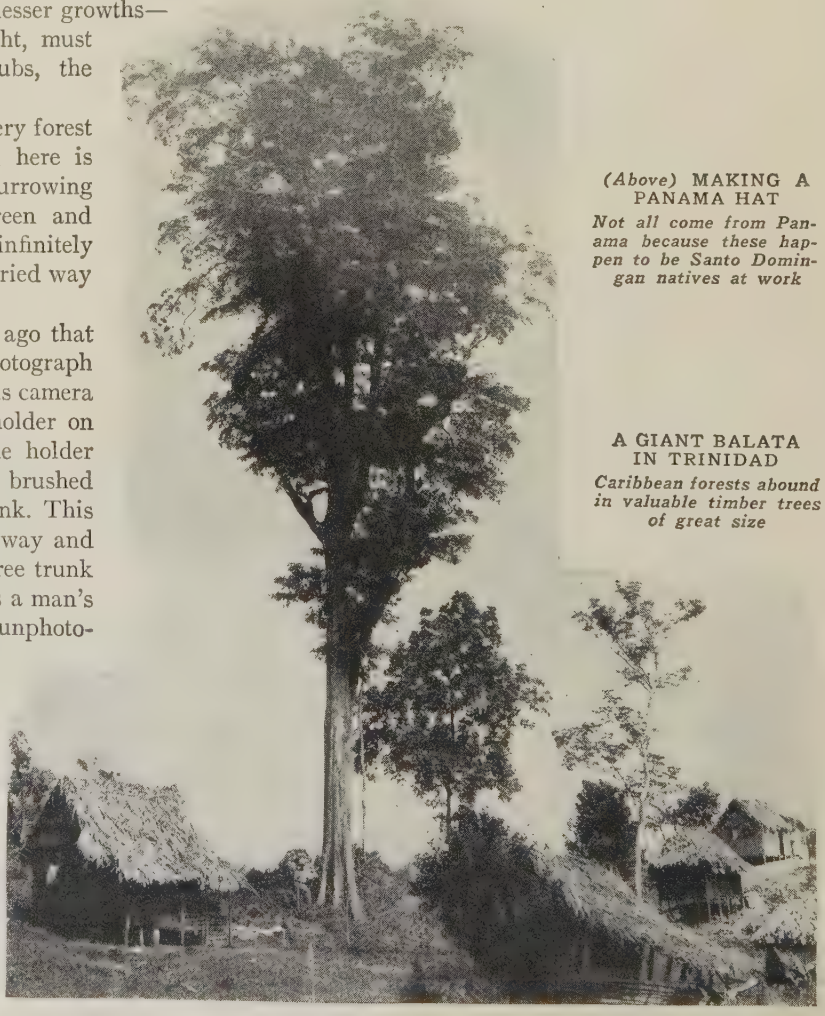
It was in such a forest not so long ago that a British tourist kneeled, seeking to photograph a bird of brilliant plumage. Focusing his camera with great caution, he laid the plate holder on a prostrate tree trunk beside him. The holder slipped to the ground. Impatiently he brushed it clean and placed it again on the trunk. This time the holder was knocked ten feet away and with a hiss and a rustle of leaves the tree trunk glided off—a python as thick around as a man's thigh. The bird probably remained unphotographed.

The dreaded wild hogs make their home here, in these tropical jungles, and nose about in great droves seeking roots and forest fruits. And here, by the water's edge, at dawn and sunset tapirs come down to drink, huge mule-like creatures with feet like a small elephant's, and a snout like an elephant's abbreviated trunk.

In the branches above, up where the sunlight falls still another world exists. A noisier, more colorful, less furtive world. Droves of monkeys hurrying by on some mysterious errand among the tree tops, or feeding on wild plums or zapotes. Flocks of parrots suddenly grown articulate with the dawn, screaming and clattering their wings as they rise in unison. Perhaps nothing is quite so breath-taking as the sudden swoop of a huge flock of these birds, when at evening they decide upon some dead tree as a night's resting place. There is a whir, like the far-off whir of many planes, and in an instant the tree, a moment before a gaunt, gray skeleton, now blazes with life, color and sound. It is green again, but with a gayer and more dazzling green than ever it knew in its days as a living monarch of the jungle.

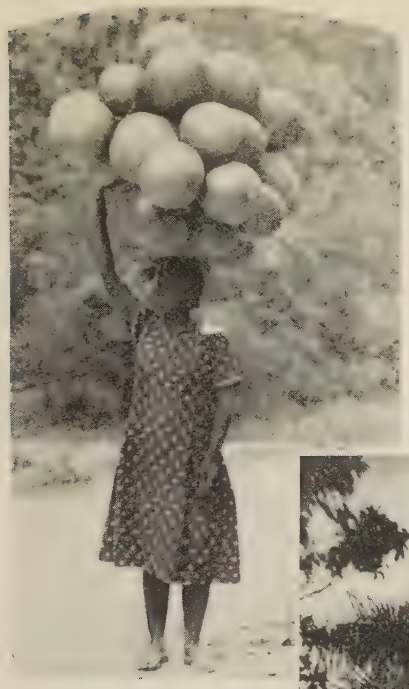
But for most of us the lure of the tropics is not in their jungle, nor even in their gem-like lagoons. Certainly part of the spell it holds lies in the fact that down there Nature has not yet been dominated by man and by man-made things. Life is more simple. Life confines itself to fundamental things, the very basic things, such as hunger and sleep and play. That, too, is why the people one meets there, the peon who doffs his straw sombrero to you along some dusty road, or the black wharf boy sunning himself beside the dock—that is why they seem like children carelessly happy and forever unspoiled.

Child-like in their hopes and fears, too, and very much like children in the superstitions with which



A GIANT BALATA IN TRINIDAD

Caribbean forests abound in valuable timber trees of great size



PAGE HERCULES!
These gourds, which grow plentifully in Haiti, are not nearly as heavy as they look, so spare your pity for the young lady

(*Right*) BRINGING IN THE CHAIRS
These native Haitian products find a ready market in the towns along the seacoast

(*Below*) COLUMBUS MOORED SHIP HERE
It is said that he tied the Santa Maria to this ceiba tree when he reached Santo Domingo

ROYAL PALMS
Everywhere in the tropics they bring exotic beauty to the country side

PRIZE BABY
And, furthermore, its costume is quite the thing in the tropics

their little world is hedged about. I remember the two husky black boys who went with me into the Haitian forest to help collect specimens of rare and little known trees. Coming to one tree that the botanists call ceiba, but known in Haiti as mapou, I asked them to cut it for me. They shook their heads.

"C'est trés mal, ça," one of them said at last. "Very bad" but they would not tell me why. And when after ten minutes of futile urging I took the axe and buried it in the soft, white wood of the tree both boys gave a shout of dismay and fled into the forest. I never saw them again. I had woefully sinned against their gods.

That tree, I learned later, is the great voodoo tree of Haiti, and beneath its wide branches old African dances are danced and strange incantations made. It is the home of mighty spirits, an object of veneration throughout the coastland of the tropics wherever the negro influence extends. Some legend, perhaps, that they had brought over in the slave ships from Africa centuries past, some superstition regarding a similar tree there, has fastened itself upon the ceiba of this continent.

And I remember the child-like faith of these tropical people on quite a different occasion. He was a young boy, half Indian, half Venezuelan, and I had taken him in a little twenty-foot launch to cross from the island of Trinidad to the Venezuelan mainland. It was a mad venture and nearly ended badly. Caught miles from shore in the outgoing tide, and beaten by a vicious east wind, the boat began filling. At last the engine flooded. We wallowed helplessly amid mountainous waves. It was a time of frantic bailing and hopeless glances toward the low, far-off coast. Wave after wave swept us, drenching us with salt spray, and as the minutes passed we found ourselves a little lower in the water, a little closer to disaster. Our only hope lay in bailing, yet twice I saw the boy stop in his work as if trying to recall something that would not come to mind. Impatiently I told him to get to work. But he shook his head.

"If the señor will only let me remember. It is a charm my mother taught me. A charm against the storm. If I can only think the words of that charm it will all be well." And he sat there very wet and puzzled while the wind shrieked in high merriment across the storm-tossed bay.

Well, perhaps he did think of the words for that charm after all. At any rate two hours later the wind died and just at nightfall we limped into a little port on the coast of Venezuela to find dry clothes and safety.

Yet not everywhere in the tropics does one find the palm fringed lagoons, or dark impenetrable jungle. Theirs is a varied charm. Beyond the tropical seacoast and up on the shoulders of mountains cling little out-of-the-way towns and cities where springtime is eternal. Never too hot, never too cold, the air bright and sparkling like wine. Such a city is Caracas, capital of Venezuela.

A PICTURESQUE CASUARINA TREE
They are used widely for ornamental planting and for reforestation in the West Indies

In a straight line Caracas is only six miles from the coast, but it is twenty-one miles by way of the well paved automobile road that spirals up the steep high mountainside from the little coast town of La Guaira. Few rides in the world are more attractive. As the car climbs, the blue of the Caribbean deepens and the little white-sailed fishing boats shrink until they become a toy fleet upon a blue toy ocean. It is eternal summer down on the coast, and at first one drives through dry desert sands and forests of tree cactus. Then the air cools, the vegetation changes, cactus giving way to spreading broad-leaved trees until an hour later the heavy, rank vegetation of the "rain-forests" surrounds the road. There is a new chill in the air, the chill of early spring time, and the flowers along the roadside are no longer tropical flowers alone,—they are old friends or very much like old friends that we have known back in the temperate zone. Violets, dandelions, blooming side by side with the true vegetation of the tropics.

In Caracas, itself, is an institution that has existed for many years, a source of never ending delight to every stranger. It is the bird and flower market. Here gathered from the highlands of the Andes and the hot upper tributaries of the Orinoco, from the cactus-studded coast land and the green, far-off Llanos of the interior, are brought together birds of every size, plumage and song. Caracas does a brisk business in birds, for the Latin-Americans love them—love their

color, their vivacity and their charm. You find them everywhere, hanging in little brightly-colored bamboo cages in the offices, or before the doors. And the flowers that are brought down to the flower market are no less amazing than the birds themselves, nor less varied in color and size. I have seen orchids for sale there, huge plants covered with a dozen blooms of delicate lavender and the cost was—one bolivar. Twenty cents.

And you don't have to know much Spanish to shop at the bird and flower market. One can always use his fingers to show how many bolivars he is willing to pay. I remember one Sunday morning standing in the bird market watching a tall, blonde girl contracting with a Venezuelan bird salesman for six love birds—those little green parrakeets that because they are endlessly squabbling must have been called by some humorist, "love birds". I don't suppose she knew half a dozen words of Spanish, and the little crowd that had gathered—a crowd always gathers when anything is going on—took a profound, if not helpful, interest in the proceedings.

For one thing the girl wanted to be sure she was getting pairs. She pointed to one bird.

"Señor?" she asked.

The salesman nodded. Yes, it was a "Mr.-Bird." Then the girl pointed to another.

"Señora?"

The crowd chuckled, but the salesman nodded gravely. There followed a great flashing of fingers as the two disputed about the selling price. But they must have come to some agreement for later I saw her crossing the Plaza with the six love birds, each wearing a puzzled and somewhat disconsolate expression as they jogged along. Perhaps by now they are busily chewing their perches in some New York or Washington home, thousands of miles from their Orinoco birthplace.

One more memory I have of Caracas that I can never forget. It was the day Lindbergh flew over. We had expected the arrival of the *Gran Aviador* sometime that morning, so since dawn all Caracas had been sitting upon the roof-tops with eyes expectantly directed heavenward. Morning passed, the day wore on, and no Lindbergh. In the afternoon I went to a bull fight. The huge arena was jammed, for Lalanda, Spain's greatest toreador, was there. Following the custom of old Spain each señorita had spread her colored shawl on the front of the boxes that surround the bull ring, until the arena had become one blazing circle of gay color. Toward the hills it was raining a little, but now the sun shone, painting across the western sky a perfect rainbow that reached up from the hilltops high into the vault of heaven. A great black bull had just entered, snorting defiance to all mankind and now stood restive and eager, daring the toreadors to approach. The crowd stamped and shouted its enthusiasm, and then grew silent as each one settled into his place awaiting the conflict between man and brute.

But I noticed that the bull was not looking at the men before him. Head thrown back he seemed to be intently watching something above and beyond them. Something in the western sky. The next moment we heard the whir of an engine above us. The Lone Eagle had arrived! Our bull fight was forgotten. The arena was a sea of upturned faces. Flying low and fast, the great monoplane circled twice over the bull ring and then disappeared into the glory of the western sunset. But for many minutes the amphitheatre rocked and resounded to a flood of cries and cheers that had never greeted even the greatest of bull fighters. "*Viva Lindbergh! Viva el Aviador!*" The hills about us echoed the cry. It was a memorable moment.

It is quite appropriate, too, that the tropics should be enthusiastic over aviation, for it takes no prophet to realize that the airplane is destined for great future usefulness there. Already commercial companies are linking the islands of the Caribbean by

WHERE THE FOREST MEETS THE SEA

There is so much to be explored to discover the wealth of these tropic forests

air, and changing travel days into travel hours all along the South American coast. One journeys swiftly and comfortably in these well-constructed well-piloted planes of the tropics. My most vivid memories of Haiti and of Santo Domingo have to do with hours of travel through the clear, rarefied air of the higher elevation while the plane droned over lake and mountain top and the coast line changed and curved beneath us.

The tropics have suffered too long from tales of deadly heat and no less deadly fevers. As a matter of sober fact, in those parts of the tropics where the tourist is likely to go the thermometer never reaches the unpleasant heights experienced in many of our own southern cities. Neither, if one observes simple precautions of diet and hygiene, are tropical diseases to be feared. Nights are cool. The mid-day sun is hot—too hot for comfort. That is why a siesta during the middle of the day is a part of wisdom. That, too, is why I came to regret leaving my trunk for three days out under the broiling sun of a tropical coast village. That trunk developed all the enthusiastic virtues of a fireless cooker. Two pounds of chocolate melted and flowed down into my riding boots. Half a dozen candles acquired wandering tendencies and spread themselves neatly over my mosquito net, while my photographic films fused to a solid and useless mass of gelatin.

After all, the tropics of Latin America are so close to us, so easily and so pleasantly reached that there hardly remains an excuse for not yielding, at some time or other, to their varied enchantments. There are many routes, depending on one's time. With two months of tropical travel to look forward to, I should like nothing better than to start out again for one of the most interesting islands in the world—Haiti. And in Haiti I should take again the unforgetable horseback ride up from Port au Prince to a little French inn in the higher mountains, where it is always springtime and where an incomparable Haitian cook prepares meals beginning with the most tasty of French soups and ending with a rum omelet that fills the inn with a fragrance of its own. After Haiti I should go across the island by automobile, or better still, by plane, to a little city that recalls more than any place else some of the coast towns of southern Spain. For Santo Domingo is off the tourist line of travel and is yet quite unspoiled, and quite Spanish. And I might even leave my bed six o'clock some Sunday morning to visit again the old, rambling cathedral and breathe in again the incense, and hear the sonorous Latin chant of the padres. At this same cathedral they will show you about and tell you solemnly that over there, in the vault, lie the bones of the great navigator, Christopher Columbus. And you will be thrilled and quite impressed, until you have traveled more widely about the tropics and visited three or four other cities, all claiming with equal solemnity to possess the bones of Christopher Columbus. The man must have had more bones than a herring.

From Santo Domingo to Porto Rico is only a night's journey by boat, or a few hours hop by plane. And in that island one may easily let a week or two weeks slip by quickly and very pleasantly. And from Porto Rico, if time were growing short, I could return direct to New York. Or for a longer holiday I might take boat across the narrow strait for St. Thomas, and from there swing south among those islands of many nations and many tongues that we call the Lesser Antilles, reaching at last the little British island of Trinidad. And in Trinidad—that melting pot of races—one can happily beguile two weeks more, returning direct to the States by one of the big, fast boats that stop in Trinidad on their homeward flight from Rio.

Still that's only part of the tropics. There is southern Mexico, with its civilizations of yesterday and its romance and color of today. And there is Panama, and South America, all of them still unspoiled and distinctive, and all of them easily reached.

And perhaps it was of these things my companion of the afterdeck may have been thinking that bleak November evening.

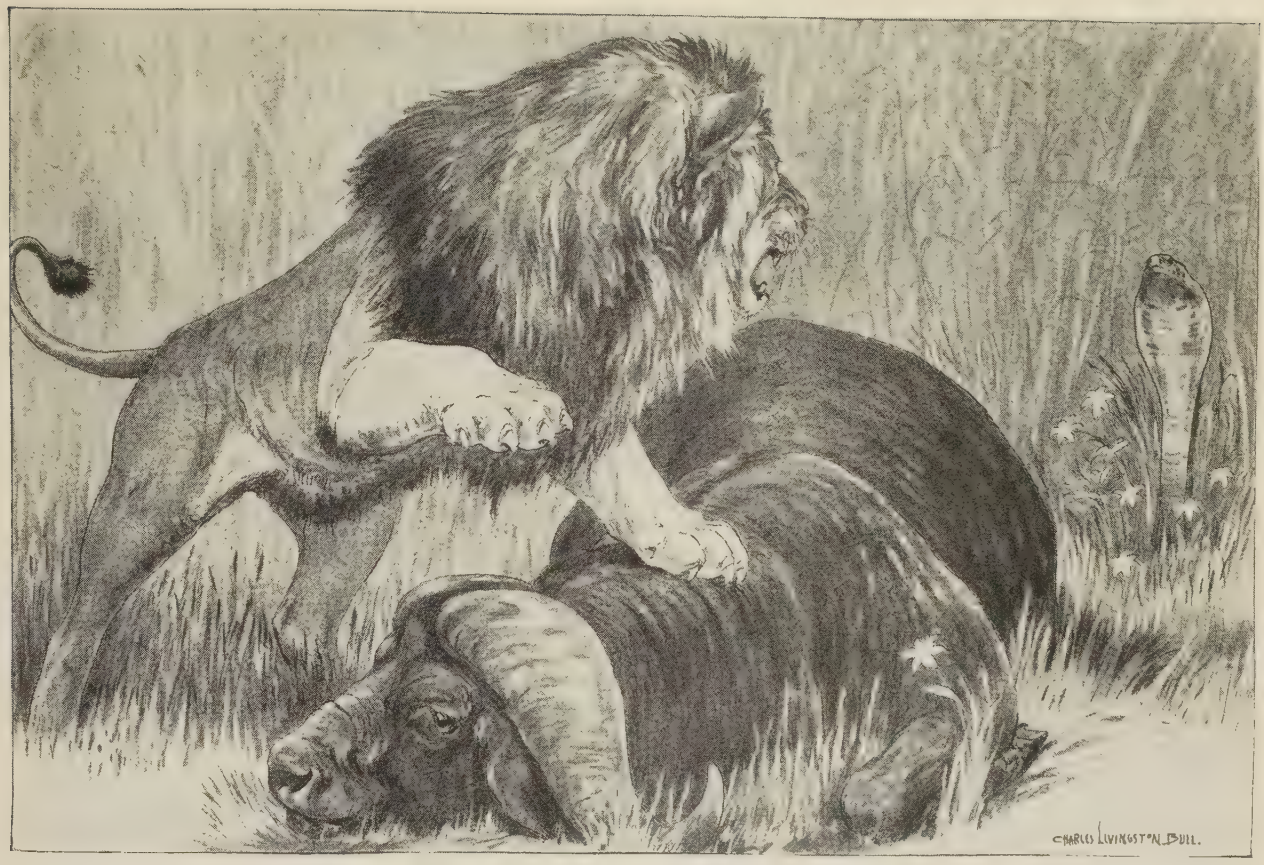
"It's different in the tropics," he had said. "There's a charm."

Well, he was right.

The charm of blazing sunsets, of cobalt seas and lazily caressing winds—the charm of a people who have never forgotten how to be children—the charm of perfumed flowers and winding roads that lead you back to yesterday. A very potent charm. And the best of it lies beyond the realm of mere insufficient words to tell.

In the February issue of NATURE MAGAZINE *Mr. L. Raymond Talbot, President of the Brookline, Massachusetts, Bird Club, will begin his series of articles on common birds of Europe. Mr. Talbot has travelled widely abroad in his bird studies and his articles are of special interest to any Nature lover planning a foreign trip.*

Mr. Howard H. Cleaves, well-known wild life lecturer and Nature photographer, contributes the leading article in the next issue, touching mainly on the eider duck and expeditionary work in Labrador. Mr. Alexander Sprunt, Jr., writes of the vanishing ivory-billed woodpecker. The second of our new series of garden articles will be presented, this one on sweet peas. T. E. Snyder tells us more about termites and their enemies; Emmett Reid Dunn writes of the giant tree frog of Jamaica; Robert Stewart tells the significance of the science of snow survey. These are a few of the features of the February number, which will also, of course, have its usual helpful departments.



"FOR A MOMENT THE KING OF BEASTS AND THAT PRINCE OF THE POISON-PEOPLE FACED EACH OTHER"

Yellow Death

When Night Follows Day on the Veld

by Samuel Scoville, Jr.

Illustrated by Charles Livingston Bull

DURING the dry season the veld was a ghastly, sun-stricken land studded with clumps of leafless marula trees, ridges of red-hot rock and tangles of wait-a-bit thorns, curved and sharp as a tiger's claws.

Today, however, Spring had come. Under her rains, soft and warm as milk, the red dust had become a mass of flowers. There were almond blossoms, drifts of lilies, miles of violets, and pools of starry narcissi, while the kafir trees were blood-red with blossoms and the bauhinias seemed covered with gigantic sweet-peas, all lavender and white with crimson centers.

Suddenly all the voices of the veld were silenced. Men say in Africa that there are two things which no one can ever mistake—the color of gold and the roar of a lion. This one seemed to begin underground, so deep and subterranean was its quality. Then it rose and swelled and burst out with a crash like thunder, only to die away at last in a moan of utter despair.

Ordinarily a lion reserves his roar for the dark of a rainy night when he likes best to hunt. This one, however, knew exactly what he was doing. The dreadful echoes had scarcely died away when a Cape buffalo burst like a bomb from out of the slough where he had been taking a mud bath. If there were lions about he yearned to protect his flanks with the six-inch thorns, white as bleached bone, of an acacia bush. His vast horns would do the rest.

The tawny hunter, however, never even gave him a chance to get set. At the sound of his splashing, the great cat reached the edge of the marsh with that miraculous suddenness of which only lions know the secret and sprang while the buffalo's hindquarters were still imbedded in the mire. As he flashed through the air the bull tried desperately to land the slashing upper-cut with one of his curved horns, upon which the buffalo-folk rely. Even as he did so the mire gave way beneath him and his armed head fell forward just as five hundred pounds of sudden death landed shatteringly across his back. Clamping his claws deep into the bull's hide, the lion reached across his face and gripping the struggling animal by the farther side of his muzzle pulled the great head towards him. Slowly it yielded, swung around.

If the buffalo had been on solid ground not even the tremendous strength of the lion would have availed against the steel-strong muscles of his massive neck. Without the fulcrum of his hind-legs, however, the pinned animal was unable to bring to bear his full strength of resistance.

The muscles of the lion's fore-arm showed beneath his yellow hide like iron ridges and slowly the buffalo's head with its staring, anguished eyes moved sideways. Then the lion crouched lower and with a sudden effort put forth all of his vast power. There was a cracking noise, a moaning bellow, the bull's long tongue suddenly protruded from his mouth and the next moment, with the vertebrae of his neck dislocated and broken, he fell forward a lifeless mass of quivering flesh.

For a moment the lion lay panting upon the carcass of his prey. Then he slowly gathered himself together, stood erect on the huge body and raising his head with the smouldering eyes and shaggy black mane, stared haughtily about him and roared crashingly across the veld, the very embodiment of proud majesty. He looked the royal animal even in the shambles.

Then, even before its echoes had died away, there sounded close beside the king of beasts a cold, sibilant sound. Compared with his roar it was but an insignificant noise indeed—yet it was the voice of Death himself.

Slowly the seven-foot body of a great serpent, gleaming in the sunlight like burnished gold, with a tinge of crimson and umber on some of its scales, moved out from a patch of violet lilies and reared itself three feet from the ground, while the movable ribs just below its neck swelled into the fatal hood of a Cape cobra. Above the hood the snake's head, no larger than an English walnut, stared at the lion from red, lidless eyes, while the glittering body swayed back and forth, ready to deliver the fatal lunge of its kind.

For a moment the king of beasts and that prince of the poison-people faced each other. One blow of the lion's paw would dash out the life of the cobra but—one touch of the snake's hollow fangs meant death to the great cat. Again the fierce hiss of the serpent cut through the air, its body tense and motionless as it made ready to strike. At the sight, with a snarl the lion bounded away leaving the rigid figure on guard over his kill.

That night a honey-yellow moon became entangled in the twisted branches of the marula trees. As it slipped through them, all the colors of the great blossoms melted into silver. It was spring and the air was filled with soft calls and cries—the love notes of kloof and veld. Yet death was there, companioning, as always, with beauty and love and lurking amid the shadows.

Down a game-trail, like a tiny kangaroo, bounded a gerbille, that leaping-mouse with the beautiful eyes and a skin like brown satin lined with white silk. Just as the little animal reached a stretch of the path silvered by the moonlight filtering through the branches overhead, there was a flash of yellow and the death which had threatened the lion overtook the mouse.

As the fatal fangs of the cobra pierced the gerbille's side, the snake sank them deeper with a curious chewing motion, clinging like a bulldog to the little beast and at the same time contracting the muscles which encircled the poison-glands in its head until they wrung out the pale-yellow venom and shot it in two jets deep into the mouse's body. Swift as fire the poison crept along the nerves of the gerbille until, in less than thirty seconds, it reached and paralyzed the heart of the stricken beastling.

Even as he trembled and fell dead, a newcomer appeared upon the narrow trail, an animal about a foot long with a black body striped with yellowish white and a white tail.

There are few dwellers in the veld who dare face a Cape cobra—especially after dark. The little beast approaching the grim figure that night was one of the few. Those little hunters, the Bushmen, call him "Iquaqua", which in their clicking tongue means "Brave One". Scientists have catalogued him as a "zorilla" and to the Boers he is the "muishond". Whatever his name, he is Africa's answer to the challenge of the American skunk.

He has the same coloring, the same devastating gas-attack which he learned a million years before the Great War, and the same motto—"Don't hurry—others will".

As the fire-red eyes of the cobra caught sight of the imperturbable, unhasting zorilla, the great snake reared up in the moonlight and again the hood of death showed below its fatal, waiting head.

At the sight Iquaqua arched his tail over his back like a pleased cat, only with him this gesture meant a fight to the death. As the little animal trotted along without pause and without haste, the cobra hissed fiercely. At the sound the muishond's eyes gleamed green in the moonlight and with a startling succession of tiny, high-pitched yells, he rushed upon the cobra.

As he came within range of the snake's fangs he feinted an attack. Instantly the cobra's head lashed out. There are few movements in Nature swifter than the stroke of a snake nor could any human have avoided that lunge. The muishond, however, perfectly balanced on all four feet, slipped the cobra's lead like the expert little fighter that he was and the grim head struck the ground with a thump at the exact spot where the black and white battler had stood only a fraction of a second before. Before he could take advantage of the snake's miss, however, the cobra had snapped back into position and the duel began once more.

For half an hour the fight between the two went on exactly as it had commenced. Again and again the zorilla feinted. Again and again the snake struck. Again and again the muishond was not there. Finally when it

THIS is the first of a group of six articles by Mr. Scoville, the noted wild life writer who needs no introduction to the reading public. The group is devoted to the story of the six most dangerous snakes in the world. This is a subject, we realize, which does not please many of our readers. On the other hand, there are many others who have been successful in downing their inhibitions about snakes and will be glad to read about these interesting, albeit deadly, creatures. We feel that Mr. Scoville has told six fascinating stories of the wild and we are happy to have these stories illustrated by Mr. Charles Livingston Bull in his most remarkably effective style.

seemed as though the contest must end in a stalemate, after an especially desperate lunge the cobra did not rear up quite as instantaneously as it had been doing. When this had happened twice, the muishond stood for a second just beyond the range of the serpent's stroke and seemed to regard his opponent with a curious air of calculation. Then for the last time he rushed forward, snapping at the swaying body before him with his long, narrow jaws. Once more the cobra lashed out and for half a second lay stretched out on the ground, exhausted by the long fight.

That was the moment for which the muishond had waited. Even as the snake started to raise itself the little animal was upon it like a fury, and seizing the reptile just below its hood, with a single lightning-like snap of his long jaws crushed the cobra's back-bone at that point.

Immediately the striped battler gripped the snake's gleaming body again and again, each time piercing its spine, until it lay stretched out writhing but paralyzed. Then with an air of grim confidence the muishond approached the cobra, gnawed the deadly head from the long body and swallowed it, evidently knowing that the gastric juices possess the property of rendering all snake venoms harmless. Or instinct told him these facts of natural life.

"AT THE SIGHT IQUAQUA ARCHED HIS TAIL OVER HIS BACK LIKE A PLEASED CAT"

A moment later and the little beast was feeding full upon the white flesh of one of the few creatures on the veld which had ever driven a lion away from his kill.

THE voice of Nature arouses in every man an unconquerable desire for happiness. In contemplating the spectacle of Nature we find everywhere order and harmony, a beauty that enlarges our affections and calls forth virtue within us by destroying egoism. The idealized field enlarges itself and fills agreeably our lives, which become beautified again at the thought of other scenes that our travels have given us and which we compare with those by which our eyes are struck daily.

The pleasure that we take from the arts is but passing, the satisfaction given by the study of the sciences is mixed with dryness; on the other hand the contemplation of Nature brings us an impression as agreeable, as sudden, and at the same time as durable. It is from the point of view of this feeling that the English say, "A thing of beauty is a joy forever."

Thus it is that in enlarging the domain of pure joy we augment the sum total of happiness, which progresses forward from the pleasure of the senses to the pleasure of the soul, and a love of the good.

EDOUARD ANDRE—*Parcs et Jardins*

THE LINK WITH THE TANKS
President Wilson, *a tiny but sturdy bond between the huge death-dealing caterpillars and the rear lines*

MESSENGERS in

by Paul F. Hannah

Photographs by Courtesy of the Signal Corps, U. S. A.

DAWN crept with tiger tread over the Argonne. The blaze of mortars and the sudden flashes of bursting shells dimmed. Black, torn stumps revealed themselves—huddled together, leafless, gaunt, in the cold gray light. Tangles of barbed wire and ugly jagged furrows that were hastily dug trenches appeared, grew distinct, more ugly. The muddy earth trembled with the pulsating throb of shell-fire. The sharp staccato of machine guns beat an endless, deadening tatoo. And the men of the Seventy-seventh division, A. E. F., stretched out in the muck of the water-soaked ditches cursed their cold and hunger, cursed the enemy surrounding them, cursed the cries of the wounded. Five days! Five eternities a mile ahead of the front line. Five stealthily creeping gray dawns cut off from food, with ammunition failing, with no word of relief from the rear. . . . Would it never end? And now, their own barrage was falling on them, cutting down their dwindling ranks. . . . a lost, a hopeless battalion. . . . .

Suddenly from one of the black gashes in the earth arose a flutter of wings, almost drowned out by the bursting shrapnel. A bird, white against the mud, rises, circles above the huddled masses of men. The concussion of an exploding shell dashes it almost to the ground, but again it climbs and circles, then is gone, lost above the torn, splintered tree-trunks. And from the haggard-faced men who saw it fly a faint cheer arose—a cheer for a last hope. The last pigeon! The last link with the main lines, to tell them that food was gone, that capture was near, that American shells were falling on American men.

Through the mists of powder-smoke flew the pigeon. Over great batteries that crashed and shook the air. Over machine gun nests, rudely hidden under branches; over mud-trampled "No Man's Lands", shambles of twisted wire and stilled bodies. Bullets whined, shrapnel clattered. Straight on its course flew the bird, travelling low, with an instinct in its blood born of ancestors older than the Greeks. On, on. Suddenly a deep quiver ran through its body; it wavered for an instant, then again regained its speed, but now one of the slender legs hung by a few threads of skin. Through the mad, frantic din it sped. An airplane zoomed downward behind it, and crashed. A shell burst at one side. A battery flashed beneath. Still it went on. Then suddenly again it seemed to stop in mid-air, as if it had run into some obstacle. This time a wing drooped, and it crumbled, began to fall. But before it hit the ground, the wings beat furiously again, and it mounted and kept on toward the American lines. A slow trickle of blood from its breast spread in a dull stain over its feathers. Slower and slower—its course was a zigzag now. At last—the home loft! Down with weakly fluttering wings, down to the lighting board, just a bloody mass of feathers. Hands grabbed at it. Fingers tenderly removed the precious message tube from the shattered leg . . . Orders, quick, decisive. Batteries rumbled into new positions, ceased to shell the exhausted, half-starved men. Commands to relieve Major Whittlesey's battalion were given. . . . The last link had held.

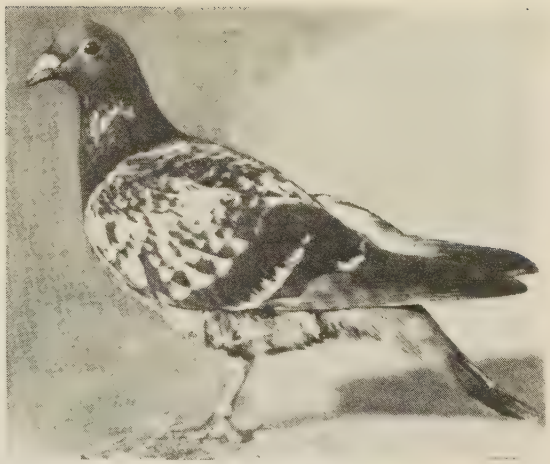
* * *

Heroes—these messengers of the air. When the complete history of the World War is written, it must include the rôle these birds undertook, must tell how they flew through the rain of death when communications had failed, and runners could not get through. It must tell of Big Tom, who dashed from Grandpré to Rampont, twenty-four miles, in twenty-five minutes,—and who was wounded twice on the way; it will have the story of

BACK TO THE HOME LOFT
Here they come, the weary flyers, after their practice flight in Hawaii

STORM and WAR

Birds of Romance and Adventure Whose Intelligence Serves Man



ALMOST A MILE A MINUTE
For twenty four miles flew Big Tom, a war hero, with leg and breast pierced by gunfire

The Mocker, who, with one eye destroyed, carried a message which enabled the silencing of a deadly enemy battery within twenty minutes. And this history, when complete, will record the four hundred important messages delivered by 442 brave birds during the Meuse-Argonne offensive, and mention the two gold-star mother pigeons whose young never returned from the front. Twenty thousand birds in the American Expeditionary Forces, five hundred thousand in all along the front lines, and upon their wings and homing intelligence thousands of lives depended. War heroes, all.

It was not only in the World War, however, that homing pigeons used their superhuman powers to serve men. As early as the Fifth Egyptian Dynasty, five thousand years ago, when Europe was forest and swamp, pigeons were domesticated, and the ruler Solomon made much use of homers during his reign. They were brought to Greece from fading Persia and an obscure Greek poet, Anadreon, living in 500 B.C., sang the praises of the carrier pigeon, and thus gained immortality. The news of Olympic winners in the Golden Age were carried to the city-states by these birds. Their value in war time was utilized by the Romans, and Pliny, in his *Historia Naturalis,* records that in the troublous days following Caesar's death Octavius communicated with Brutus, besieged at Mutina by Anthony, by messages hung around their necks. "And what service did Antony derive from his trenches and his vigilant blockade", the historian writes, "when the winged messenger was traversing the air"? What help indeed, when a little bird was his enemy?

During the Middle Ages the infidel sultan Noureddin Mahoud in the Saracen Caliphate established a Bagdad pigeon post system which lasted from 1150 to 1258, much to the consternation of the less practical Christian foes. The Dutch carried the birds to Europe for the wars in the Netherlands, and William the Silent used them at the siege of Haärlam, in 1573. Later, during the perilous days of Napoleon I, the great Rothschild established many pigeon lofts, and utilized the early reports the air messengers brought on Napoleon's battles and victories to amass great fortunes. A lone pigeon homed to carry to him news of the battle of Waterloo, and millions of francs flowed into his coffers as the result.

When the Franco-Prussian prelude to the World War was being staged, in 1870, an air service was inaugurated between Tours and Paris, with messages at half a franc a word. Newspapers, photographically reduced, were transported. An army-laden Europe began to see the true worth of these birds, and governments raced to establish breeding stations and lofts. War had obtained another handmaiden.

The gentler sport of racing homers developed in Belgium in 1818, when the first great races were held, and through the years this little nation keeps the lead in the pastime. Every village has its *Société Colombophile,* while the annual Belgian *Concours National,* a five hundred mile race from Toulouse to Brussels, is a national affair which makes the English Derby or an American presidential election pale to insignificance. United States became enthusiastic in the late eighties, and today there are more than six thousand fanciers here, while half a million birds are banded each year.

STRAPPED IN FOR THE JOURNEY
This shows the way birds are carried on their long trips before flights

Whence came this bird, that travels unerringly for more than six hundred miles from his

home loft, and at the rate of nearly a mile a minute? He is an amalgam of different pigeon stocks, a descendant of the dove Noah sent out as messenger from the ark. In his veins flows the blood of the English dragoon, descended from the true carrier stock of Bagdad and Babylonia, according to Captain J. H. W. Morgan, an English authority, and that of the ratta, a swift, low-flying bird bred by the Mogul Emperors of the East. Long ago, his ancestors were strengthened by breeding with Smerle stock, that claims affinity with the owl, and that is sturdy, short-faced and swift. He derived his staying powers from the Indian-born culumlet, a variety of the high and long-flying tumbler. The bizet, or wild rock pigeon, whose descendants were the racing antwerps, helped produce a new stock. Thousands of inter-breedings, always with perfect birds, followed through the years. Endless training, to develop the native intelligence to the highest. And the results are still marvellous, unexplainable, even to those men who have worked with the homer of today.

A NATION ACCLAIMS HIM

Cher Ami *is believed to be the bird which brought relief to the Lost Battalion. He now rests in state at the National Museum in Washington*

To mere humans, who need a compass and map for even short voyages, a creature that can journey half a thousand miles from its home in a covered container, then speed faster than an express train back over mountains and forest to pick out its tiny loft from the immensity of the landscape is somewhat miraculous. Nor has a completely satisfactory explanation of the homing power of pigeons ever been advanced. Dr. Genois, a well-known Belgian fancier, believes that the birds travel in a state of self-hypnosis, and in this condition are like animated wireless telegrams, with the starting points the transmitting stations and the home lofts the receiving posts. A spiral canal in the ear containing a fluid may act as a delicate indicator, much as a wireless apparatus, he believes. Dr. Wuttall, an English authority, suggests that the peculiarly-constructed eye may contain another organ besides that giving sight, and in this lies the origin of the homing faculty. Whether or not these explanations will stand the test of time, however, it is now plainly evident that the term "instinct" explains nothing. It is the intelligence of the birds that carry them through—intelligence composed of great powers of observation, attention, memory, will and sense of direction. Their powers are attributed to extraordinary acuteness of certain senses. The unusually mobile eye with the crystalline lens, and the great accommodation and ciliary muscles that allow large range of focus, give great clearness and penetration of sight. The three semi-circular ear canals evidently serve as orientation mediums, and register accurately slight magnetic and atmospheric changes, for it

WILL THE LAST LINK HOLD?

Upon the pigeon's wings the lives of thousands depend, when wires are down and death creeps on every side

can be demonstrated that lesion of these canals destroys the sense of direction. The enormous lung capacity, increased by air pockets under the skin, and the strong muscles of the body assure sustained flight. These are the natural aids which enable the homers to perform such feats. But even such rational disclosures do not dispel the wonder which these birds cause.

The training of birds is a task requiring patience and diligence; the breeding of them is a life work. The young "squeakers" are removed from the parent bird when less than a month old, usually before they can fly, and through association of the home loft with feeding, are taught to go from the "lighting board" into the loft. As they begin to fly, they are "tossed" farther and farther from the loft, until as yearlings they are making two and three hundred mile flights, or, in case of those trained for "short distance" communication, hundred mile journeys. Very carefully are their feeding times related to their trial flights, and they are kept hungry, though not underfed, throughout their plebedom. After they begin to mate, their efficiency varies considerably with incubation periods, due to domestic desires. Only one squab a year, however, is allowed by the stern, hard-hearted pigeoneers. Females are at their best when the eggs are about eight days old, while the cocks are sent upon their first five hundred mile trial trip when their youngsters have been hatched about ten days. Three-year old birds are at their peak, although they can be kept in condition until the seventh, or even the tenth year.

AMONG THE WONDERS OF ALL TIMES

The mystery of the unerring homeward flight of these birds has never been solved, and their achievements never duplicated

One of the recent achievements of the Signal Corps has been the training of birds for night-flying, a feature which greatly increases their usefulness. Slow, patient training lasting for several years, however, alone brought about this important development. A few minutes earlier each morning the pigeoneers have to rise, to send the birds on their trial jaunts; and later each evening they must sit up, to make the evening test. So careful has been the training that most of the birds can now find their loft even in utter darkness, although usually the lighting board and the interior are illuminated. Curiously enough, the homers fly better on black nights than on evenings when a full moon is lighting up the surrounding country.

Pigeons, in day or night, do not fly air-line for the home loft, experts have determined, but take the easiest routes. When released from ships, they speed to the nearest land, then follow the coast. In overland flights, the valleys are much preferred, since wind resistence is low. They appear to guide themselves by conspicuous landmarks. And even when lost and storm-tossed, they manage to pick up their bearings. Theirs is the motto of the U. S. Mails—"They must go through".

The United States Signal Corps has been an important factor in racing homer development in this country, and its extensive lofts in all parts of the country have sent forth winners who have seized the laurels in competition with thousands of privately-owned birds. The Fort Monmouth, N. J. station has a very large group of prize-winners. The Navy maintains its own unit. Most of the nine hundred thousand birds in this country, however, are privately owned, and the popularity of racing homers is largely due to such civilian organizations as the International Federation of Racing Pigeons, the American Racing Pigeon Union and the National Association of Racing Pigeons.

The American armed forces, when the World War reached out and plucked this country into its grasp, had few pigeons and less faith in them, and civilian trained birds had to lead the way to the Western front. Exceptional were the officers and men who wanted before 1914 to go into the "poultry business". The Mocker, Cher Ami and Big Tom have taught them differently.

Hardly a beautiful bird is the homer, but he seems to radiate that quality which seldom goes with great beauty—dependability. His head is convex, with forehead development on both sides, and with the back deep and wide. His bill is sturdy. The neck is well-feathered and strong, and the chest broad and full. Muscles ripple under the feathers on his shoulders, and his back is that of a long flyer. The belly, far from being robin-like or bankerish, is reduced to the smallest proportions. The feathers on top of the wing overlap like shingles on a roof. His legs appear to be serviceable enough to enable him, in case of forced landing, to walk home. It is the eye, however, that one sees first and last—it is piercing, brilliant, all-seeing. It would be most curious to discover what it sees in man.

The homer and the carrier, though once their blood joined, are very different birds today. The carrier, a larger bird, sits sad-eyed in shows, its homing ability gone, and blindness from great eye ceres and wattles close upon it, perhaps dreaming of the glorious past, when a Greek poet sang of it five hundred years before Christ. It has had to bow to the exploits of the other.

Each year sees increasing uses for the homer. He is not only for wartime, midst shrapnel and poison gas, when the sappers cannot keep their wires intact. Nor is he only for the pleasant sport of racing. The forest patrol uses him for reporting fires. Small racing yachts, not equipped with radio, carry him to report their progress. Air-mail pilots are taxiing off on their hazardous flights with two or more birds safely stowed away in their cockpits, to furnish means of communication with their stations in case of forced landings in isolated localities. Balloons employ them as safeguards. Messages that have to go through, regardless of broken telegraphic communications or impassable roads, are sent on these tireless wings. Not infrequently the outside world first learns of the fate of flood or storm stricken areas when an exhausted rain-soaked pigeon flutters down on its lighting board. And as time goes on man will devise still greater uses for this faithful bird, whose only desire is to return to the home loft.

One of the greatest handicaps pigeon-fanciers have to work under is the hunter who shoots everything he sees. Hundreds of homers are killed each year by gunners that do not distinguish between game birds and these valiant flyers, and many more return to their lofts with gun pellets lodged in their bodies. It is alleged that certain huntsmen gather in the vicinity of a well-known liberating point on racing days to shoot these birds for the "sport". Recently two birds were released from New York City carrying messages from the American Women's Association to Mrs. Coolidge. One returned, badly wounded. The other, *Colonel Lindbergh*, had evidently been killed. Efforts are being made to obtain Federal statues to protect all racers, but the fact that such measures are necessary reflects not too favorably on the quality of the "sportsmanship" of some American "sportsmen". A homer, who flies low and straight, is an easy target, and one that can hardly be mistaken for a legal object of gun-fire.

Down through the ages has come the homer. Men have modified it, adapted it, exploited it for their purposes, whether those of sport, or those of killing their fellow men. It is probably the creature that of all the animals, including man himself, has best realized in full its powers. Nor is its future behind it—the radio and the telegraph have not surplanted it. It remains the last link. The mystery of its homing faculty may never be completely solved, and the wonder it occasions, as it wings unerringly over mountain, sea or forest, through the smoke of battle or forest fire, through the night, through fog, will never fade. It is a bird of romance and adventure, a messenger in storm and war, a marvellous creation that man and Nature together conceived.

THE BOSTON TERRIER

by Josephine Z. Rine

BEST OF TWO BREEDS
Champion SoBig of Sunny Hill, from Caldwell, N. J.

THE Boston terrier is a thoroughly up-to-date little gentleman, having been admitted to registry as recently as the year 1893. He takes his name from the city of Boston where he was created fifty years ago by crossing a bulldog with a bull-terrier. Though his progenitors came from across the sea, the Boston himself is a native American. Out of a total of seventy-nine breeds, only four can rightly claim this country as the land of their birth. The Boston is remarkable also in having behind him no working heritage. Almost every other pure-bred dog in existence today started life centuries ago as a worker, even though the great majority now rank merely as pets.

The Boston was created a pet by a little band of dog lovers who sought to mold in one dog the best characteristics of two. They made a breed that embodies the courage and steadfastness of the bull with the style and vive of the terrier. Glad-hander and easy mixer with humans, the Boston claims the doggy prerogative of fighting his own kind when the spirit moves; a prerogative that comes to him directly from a fighting ancestry. His soft, round eyes can, upon occasion, breathe the scorn of the proverbial dirty look which, combined with a bristling up and a swagger air, is sufficient to start a rugged row of no mean proportions.

But with humans he is a truly affectionate and taking little fellow. His brindle coat is broken by definite lanes and patches of white. A broad white stripe goes up the center of his face, runs back over his crown and down to meet a perfect collar. White stockings on his forelegs and white gloves behind complete the markings that stand as a triumph of the breeder's art. In conformation, he is a square, and within that square are the squares of head, skull and muzzle, with the whole of him finished off with a tiny screw tail.

INTRODUCING TWO BRIGHT SISTERS OF GREAT BEAUTY

Among the fairest of gladioli. On the left a ruffled variety, and a plain-petalled flower adjoins it

JUST "GLADS"

All the World Loves the "Poor Man's Orchid"

by Clarence E. Baker

Purdue University Agricultural Experiment Station

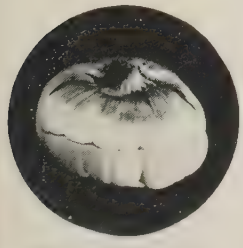
FEW FLOWERS can claim the host of loyal admirers that the modern gladiolus has won from among the garden lovers of America during the past twenty-five years. Although it has been grown in this country for many years, only during the last quarter of a century have its true merits as a garden flower and as a commercial product begun to be appreciated. During that time hundreds of lovely new varieties have been introduced and the older and less beautiful ones discarded, so that the gladiolus as it is known today is an article of exquisite perfection and beauty in comparison with the gaudy, unattractive form of earlier days.

These rapid improvements in coloring and form have likely been responsible for the rapid strides for popular favor that the gladiolus has made and is continuing to make each season as more and more staunch adherents fall in behind its gay banners. This increasing popularity has won for the gladiolus many titles among which "The Universal Flower" and "The Poor Man's Orchid" are commonest. Societies are formed around it.

Judging from the enormous quantity of gladiolus blooms that are sold as cut flowers through city markets, there are still many gardens that lack their quota of this flower. The cost of a dozen cut flowers would buy a dozen bulbs of good varieties that would not only produce a dozen flowers each year, but, with reasonable care, these bulbs would increase in number yearly so that their quantity would soon be doubled or trebled. And they can be easily grown.

The gladiolus is a cormaceous plant belonging to the family Iridaceae, a large family of which iris, freesia and crocus are members. The early European botanists of the sixteenth and seventeenth centuries did not list many gladioli, but during the latter part of the eighteenth century the genus was described from France and Italy, and from then on, wild forms of the genus were described from many parts of the world. A comprehensive work by John Gilbert Baker published in 1892 listed one hundred and thirty-two species.

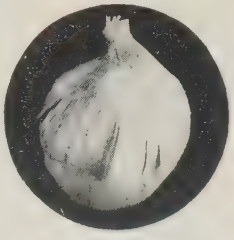
The origin of the cultivated gladiolus, consequently,



NOT VIGOROUS

Flat corms are not likely to be productive

IN THE new series of garden articles which will appear in Nature Magazine, and of which this is the first, a historical treatment of plant life has been introduced as announced last month. The distant, humble, wild beginnings of today's favorites will be disclosed, the ancestry outlined and you will be carried up to the moment in matters of selecting blooms, cultivating and arranging. Biographies of about a baker's dozen of the most popular plants have been written, and the authors are old friends of Nature Magazine readers. Do not miss any of this group of articles.



A GOOD CORM

They should be thick and plump for best results

SUPREME AS A CUT FLOWER
The graceful spikes and flowers are adaptable to many kinds of bouquet arrangements

E. L. CRANDALL

was very complex. While not all of the wild forms have any direct relation to the cultivated flower, some twenty species have been used in the development of the modern gladiolus. Many of these species may still be obtained, especially in Europe.

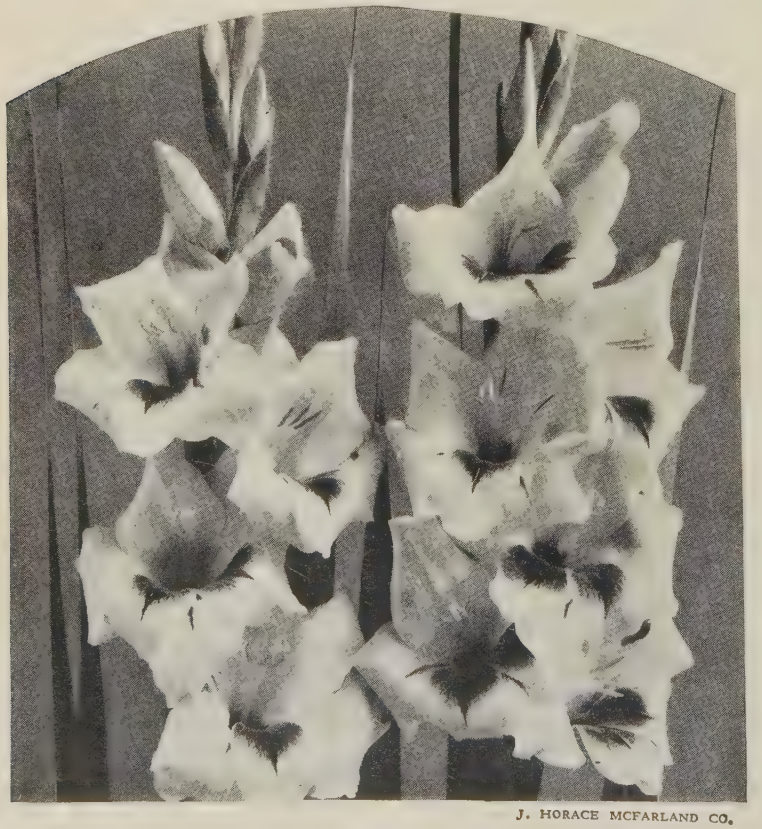
Much of the early hybridization of these various species was done by French and Belgian gardeners. Later the English contributed their effort and brought forth some worthy results. In America, the improvement of the gladiolus received little attention before about 1870, when the first American seedling was introduced. From this time on American varieties appeared more rapidly and in 1890, Luther Burbank after twelve years of experimenting introduced a strain of flowers that was larger and better able to withstand the bright sun of California.

A little later the Childsii varieties were introduced. This strain was noted for its large sized flowers and vigorous growth and has had an important influence upon the varieties developed since that time. About this same time H. H. Groff of Ontario, Canada, was working toward the elimination of the weakness of the existing varieties. The Groff hybrids are a memorial to his painstaking work and have supplied a firm foundation for the further development and improvement of the flower.

The ruffled gladiolus is the contribution of A. E. Kunderd, of Goshen, Indiana, and has formed the basis for a new type of flower. This form was developed by the selection and crossing of plants showing the ruffled petal characteristic and has supplied an artistic effect that is very becoming to the gladiolus flower.

The three main groups, therefore, as we know them today consist of the large flowered plain petaled types, the ruffled type and the Primulinus seedlings or their hybrids. The Primulinus seedlings differ from the other types in being more delicate of stem with smaller flowers spaced further apart along the stem. The colors are made up primarily of delicate shades of tan, pink, yellow and buff, although many verge into the bright orange shades and even red is not uncommon among them.

The range of colors available in the gladiolus is equaled by few other flowers. Nearly every color in the rainbow is represented in many shades. Blue is about the only color that is not procurable at its best. So far there is no really good blue variety but there are many lavenders and a few purple shades. With this exception nearly any color may be secured either as a self-color or in combination with a variety of other complementary or contrasting colors. Color harmony is also exceedingly rich in this beautiful flower and nearly every imaginable combination of colors can be found. For those who love the delicate colors, the



YOU CAN GROW SUCH AS THESE
Among the "Poor Man's Orchids", few have the beauty of the Mrs. F. Pendleton variety

J. HORACE MCFARLAND CO.

AGAINST THE GARDEN WALL J. HORACE MCFARLAND CO.

They seem to mock as they sway in the wind while their colors form new beautiful patterns as rich as the rainbow

beautiful blending of lavenders, creams, pinks, tans and yellows are sure to please. Those who love striking colors may prefer the crimsons, reds, scarlets and mahogany shades, or the blotched varieties that combine these shades with contrasting throat markings. White is represented as a self-color; there may be delicate tints of yellow, lavender or pink in the throat or on the petals or a white background with beautiful blotches of almost any shade. The dainty Primulinus seedlings likewise have their admirers and form a class by themselves in the artistic grouping and blending of lovely colors.

The gladiolus may be used either as landscape material or as a cut flower. When planted in masses of one variety in a suitable location the landscaping effect is very pleasing. As the flowers open progressively up the spike from bottom to top the maximum effect produced is short lived, and as the lower flowers wither the pleasing effect is lessened. The coloring of some varieties tends to fade when the flowers are subjected to constant sunshine.

As a cut flower, however, the gladiolus has many strong points and is beautiful in bouquet arrangements of various kinds. Groups of a single variety are always striking or a bouquet composed of several varieties, properly chosen, may be used to give harmonious color groupings. It may be used with its own foliage or combined with other flowers; combinations of roses and gladioli and delphinium and gladioli are especially beautiful. The containers used should be plain. Baskets or glass vases are especially suitable for the tall spikes. For moderate sized spikes the containers may be smaller. The upper ends of the flower spikes may be broken from the withered portion after the flower has been in bloom for several days, and used very effectively in wall vases or rose bowls. Outstanding varieties give a better effect if a single spike is exhibited in a rather narrow vase. Grace may be secured in nearly any type of an arrangement. The crooked spikes need not be discarded as they serve an important function in bouquet work by correcting the slight stiffness that sometimes prevails where only straight spikes are used.

There is a right time and a right way to cut a gladiolus bloom. The spike should be cut about the time the first flower begins to open. Some of the best growers cut the spike as soon as the lowest bud begins to show color. Even if removed from the plant at this time all the buds on the spike will open if given the right care. By permitting the flowers to bloom in subdued light the best color will be obtained. When cutting the spike leave at least four leaves upon the plant to mature the corm but take one or two leaves along to supply foliage. Make the cut diagonally through the spike, parallel to and immediately above the edge

WHERE PEACE AND BEAUTY STAY J. HORACE MCFARLAND CO.

What would the garden be without the gladiolus to bring its rainbow shades where shadows lie?

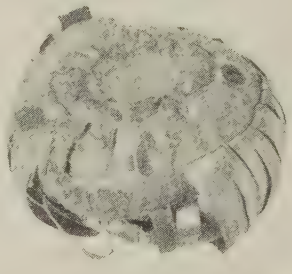
of the uppermost leaf to be left upon the plant. This makes a neat cut and does not leave a section of the spike sticking up above the leaves of the plant to detract from its appearance through the remainder of the growing season.

Change the water in the vases each day and cut off a short section of the stem with a diagonal cut before reinserting the blooms in the vase. This opens up new cells so that water may be more easily absorbed. Remove the lower flowers as they wilt and as the bloom progresses toward the upper portion of the spike remove the upper portion and place in different containers as previously suggested. By this means it is possible to have flowers from the same spike for more than a week.

But surely, you say, a flower with so many charms must be difficult to grow. On the contrary the culture is simple and easy. Like all other plants the gladiolus responds to good care and prefers good treatment but it is not unreasonably exacting in its requirements and it has few serious enemies.

A HEALTHY PLANT

As it appears at digging time, with the cormels grouped around the corm



QUITE FREE FROM DISEASE

Yet corms are susceptible to scab or neck rot, as shown at right and left, and dry and hard rot. You must watch for them

Any mellow, well drained soil of average fertility is suitable for growing the gladiolus. It should be deeply and thoroughly pulverized to provide a good medium for growth. Not a great deal is known regarding the fertilizer requirements of this flower. Probably soil nutrients are seldom the limiting factor. A fertilizer that is suitable for potatoes upon any particular type of soil is sometimes recommended for glads. Manure, if used, should be applied at least the fall before planting and thoroughly worked through the soil several times, as the gladiolus does not thrive when the corm or the roots come in contact with manure.

The depth of planting will depend upon the type of soil and the size of the corms, or bulbs as they are often incorrectly referred to. Large corms should be planted deeper than small ones and on light soil they may be planted more deeply than on heavy soil. Probably it is best to plant the corm only deep enough that it will support the plant while the flower spike is being produced. On average soil the large-sized corms may be planted four or five inches deep. If set in rows the corms may be placed five or six inches apart spacing the rows just about eighteen to twenty-four inches apart.

A succession of bloom may be procured over a longer period by making several plantings. Make the first planting as soon as all danger from frost is past, with succeeding plantings at intervals of two weeks up to the first or middle of June. Varieties differ in the time required for flowering, varying roughly from seventy-five to one hundred and ten days. Large corms usually bloom sooner after planting than do small corms of the same variety. This means that by careful planning flowers may be had from early summer until frost.

Give the plants a frequent, shallow cultivation to kill weeds and prevent the caking of the soil. If they may be artificially watered, soak them thoroughly once a week in dry weather but do not sprinkle lightly at frequent intervals as this is likely to do more harm than good.

When the leaves begin to turn brown in the fall the corm is ready to dig and store for winter. Lift the plant from the soil and remove the leaves by cutting them off about one-half inch above the corm. If the plant had two flower spikes it will be noticed that two corms have formed above the one that was planted in the spring. This means that there will be two bulbs to plant next spring. Sometimes several corms may be formed; four or five is not uncommon. The habit of forming new corms in this manner differs with varieties, some multiplying in abundance, others rarely or not at all.

LET THEM GROW

The cormels will also form blooming bulbs in a few years' time if kept

Perhaps a collection of small round growths about the size of a pea or larger will be noticed between the old bulb and the new one. These are the cormels or little corms and if planted they will in a few years grow to blooming-sized bulbs of the same variety. The abundance with which cormels are produced also depends upon the variety and the culture.

The new corms and cormels may be separated at once from the old dried up corm or the whole may be dried in the air out-of-doors for a few days and then stored and the separation made at some future time. The corms should be stored in a cool, reasonably dry place, where a temperature of about 40° F. may be maintained during the winter. Do not permit the corms to freeze but beware a high temperature in a dry heated basement.

To attempt a description of the thousands of varieties

of gladioli would require volumes. Due to the constant improvement that this flower is undergoing, the popularity of varieties is constantly changing so that many of those that were popular a few years ago are now among the discards. Personal preference also enters in so greatly that the favorite colors of one individual might not meet the approval of his friend or neighbor.

While the gladiolus has no serious insect enemies several diseases are becoming troublesome in some sections. Among the most serious are hard rot, dry rot and scab.

Hard rot, *Septoria gladioli* Pass., and dry rot, *Sclerotium* sp., cause symptoms that are somewhat similar. After growing for six or eight weeks the leaves of the plants turn prematurely yellow and the stem decays at the surface of the soil. If the corm is removed from the soil it will be found to be decayed. Sometimes the infection occurs so late in the season that the leaf symptoms may not become noticeable.

If the corms are examined when dug the diseased ones usually will be found to be small with dark or spotted leaf scales, as compared with the bright, clean, plump corms from healthy plants. Upon removing the leaf scales from a diseased corm, the lesions of the disease will be found upon the surface as sunken reddish brown-to-black, dry, "punky" spots, sometimes with slightly elevated margins. These spots vary in size upwards from the size of a pin head. During the winter the disease progresses and many of the infected corms become completely dried or mummied by spring.

Scab or neck rot, *Bacterium marginatum* McC., is a bacterial disease that also infects both the leaves and the corms. The first evidence of its presence is the appearance of small spots resembling burned places on the lower portion of the leaves, usually in the first six or eight inches above the ground. Sometimes the leaves rot at the ground and the plant dies. In a more mild case some of the leaves may become streaked with brown, but the remainder of the plant may show no indications of disease.

Upon the corm the lesions appear as shallow, dark colored depressions, usually surrounded by a definite and somewhat elevated margin. These lesions may be hidden by the leaf scales about the corm or sometimes these may break away and disclose the diseased parts. The individual spots are generally small, but, when numerous, the frequent coalescences form large, irregular, sunken areas.

Unfortunately these diseases do not respond readily to treatment. As there seems to be considerable evidence that they live over in the soil from year to year, the first step in preventative measures is to avoid planting glads on the same soil in consecutive years. Practice a rotation so that glads are grown on the same soil only every two or three years.

Do not plant any corms that have spots or that appear dried or shriveled. Remove the leaf scales from doubtful appearing corms. If they are smooth and bright they are likely sound but if they contain suspicious swellings or sunken spots discard them. Follow the same precautions when purchasing new stock and refuse to accept questionable corms.

Some success in the control of these diseases has resulted from soaking the corms for several hours in a solution of mercuric chloride (corrosive sublimate), one part to one thousand parts of water. If your stock is known to contain a slight infection, examine the corms, discard all that show visible signs of disease and treat the remainder in the above solution before planting. This method, while far from perfect, may help to check the further spread of some of these common diseases. Mercuric chloride is a deadly poison, consequently precautions should be taken to protect human and animal life. The solution should be used in a wooden or earthen ware container rather than in a metal one.

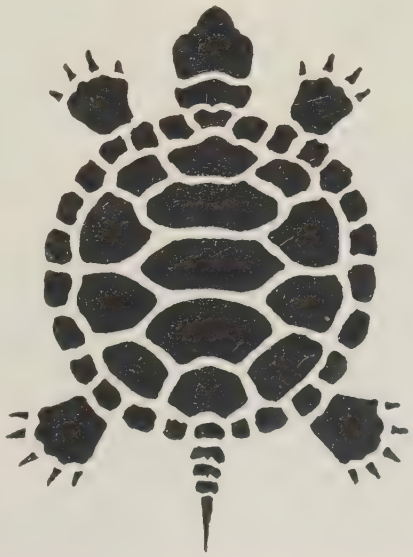
It is also a good practice to destroy any plant that appears unhealthy during the growing season. If the leaves turn yellow or brown prematurely, remove the plant, together with the surrounding soil. This may prevent the transfer of the disease to near-by plants.

Just a little care, and the gladioli are yours, to brighten your garden, or to add grace and beauty to the inside of your home. They are truly the "Universal Flower", and their popularity, constantly spreading, is deserved.

The TURTLE TOTEM

NATURE is coming into her own as a source of inspiration to artists in the world of commerce, and many birds, mammals and flowers are lending themselves to the making of trademarks and insignia. It is only a reflection of the growing interest in the outdoors.

There is reproduced here an interesting and effective design made for the Bergen County (N.J.) Historical Society by Charles Livingston Bull, noted wild life illustrator. Searching the old records, the Society discovered that the Delaware



Historical Society Has Novel Emblem

Indians who settled in Bergen County maintained the "turtle totem" and often tattooed it on their bodies and worked it into the designs on objects used in their daily life or their pursuits of war. It was therefore felt most appropriate to perpetuate this insignia.

Mr. Bull was called into consultation and the design resulted. Hiram Blauvelt, president of the Society, says that he has "never seen a conventionalized drawing that has caught the spirit of its natural subject more fittingly." We agree.

WEASEL-WISE

A Mammal With a Character that is Personality-Plus

by Gayle Pickwell

Photographs by the Author and Lester Hannibal

AMONG his mammal near-relatives, the weasel must be considered an individual with personality-plus. Not that his cousins the mink, the skunk, and others are without striking evidences of individuality, but these must, all in all, concede the palm to this slim, lithe, slender fellow.

A weasel is good to look upon, for his face, in spite of beady eyes, is handsome, his body supple in a degree almost beyond belief, and his coloring a rich blending of blacks, umber browns and tans. Add to good looks an almost total indifference to and lack of fear of man, a spirit of sprightly playfulness, and a vigor and activeness that requires almost constant motion. Then subtract from these pleasing qualities a nature which in down-right blood-thirstiness and voraciousness has no equal—certainly the total equals an individual with personality-plus.

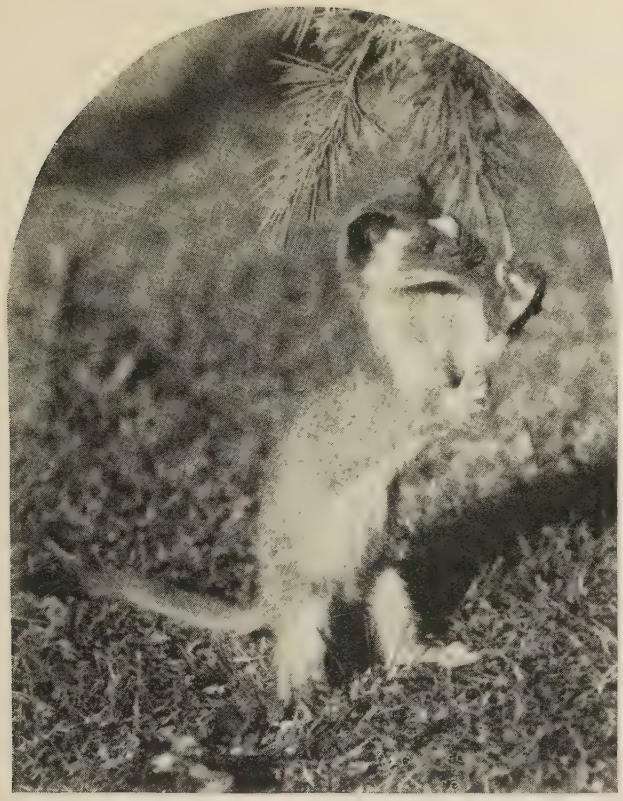
As to the lack of fear many a farmer and farmer's boy can testify. The old male skunk that lumbered into our barnyard one day in broad daylight and drove dog, chickens, and humans into shameless retreat could not exceed the impression made by a weasel, that, driven up into a tree, came down at me with bared teeth when I climbed after him.

THE MOST BLOODTHIRSTY OF ALL MAMMALS
One would hardly think it to watch him play good naturedly and move with marvellous grace

Nothing but a small mammal did he appear, not nearly as large as the fox squirrels, but he had a heart as great as a mountain lion's.

Now a questing western weasel came one bright day to the college where I write. Into a hallway he ventured, probably having exhausted rats and mice of the basement beneath. It was a Saturday and Charlie was sweeping down the corridors. As he shoved the reluctant broom along he came upon a stiff little pillar of weasel standing bolt upright on two hind legs, displaying deepest curiosity. Said Charlie to a passing helper, "Jim, why is that stuffed animal here in the hallway?" Then added, "Gosh, ain't it natural though". Jim turned to survey the mounted weasel which, curiosity satisfied, unconcernedly became unmounted and loped off down the rows of doors. Astonished janitors rushed for the naturalist and promptly a game was on.

It has been inferred that the weasel is first cousin to skunks and minks and such. This tribe, one and all, has a well known reputation for certain abilities to make the atmosphere disagreeable. But you must know that that weasel could see so little reason for such an act of last resort that it was not until



A CREATURE WITHOUT FEAR
He has confidence in his speed. Beef heart entertained him while the camera snapped

a net had been clapped suddenly over him that an almost imperturbable equilibrium was disturbed and he had the only near approach to a panic that we ever saw him have. The air, as a natural consequence, was choked with a most stifling, sickening, "sweetish" odor. Not once while he scuttled easily under table and chairs, trying to keep away from our annoying persistence, had he shown any great alarm, certainly no wild panic as a rabbit or a bird would display. Only in the sudden blackness and stifling, entangling clutches of a net did his great control desert him and the discharge of odor occur. Such is his bravery.

In a cage with net and darkness removed he became composed again, looked us over with calmness, not to say disdain, sniffed at poking fingers, tried only for a moment to pry his way out and became the cool weasel again—the animal without fear.

The cage which became our weasel's new home had been devised for chipmunks and had, as a consequence, a wheel within for chipmunks to turn. The weasel, twisting his slim, sinuous body here and there within the cage, soon found himself in the wheel. It turned. The weasel loped ahead. It continued to turn. With great satisfaction our animal applied himself to this new proposition.

There is no doubt but that the first impression of that turning wheel upon the weasel was that he was thereby getting away from the annoying creatures who had humiliated him with a butterfly net. What else could it mean? Wasn't he moving in an orthodox lope? And, if his feet were going, he must certainly be getting somewhere. So, with this in mind, he occupied himself with great industry for a moment but shortly slowed down and finally stopped, feeling no doubt, that much space had been put between him and his captors. Can you imagine the obvious look of dismay and downright disgust on his face when, turning, he saw us still beside him? Nothing to do but run a bit farther. This he did, then stopped, looked about, displayed the same comical disappointment and went at it again.

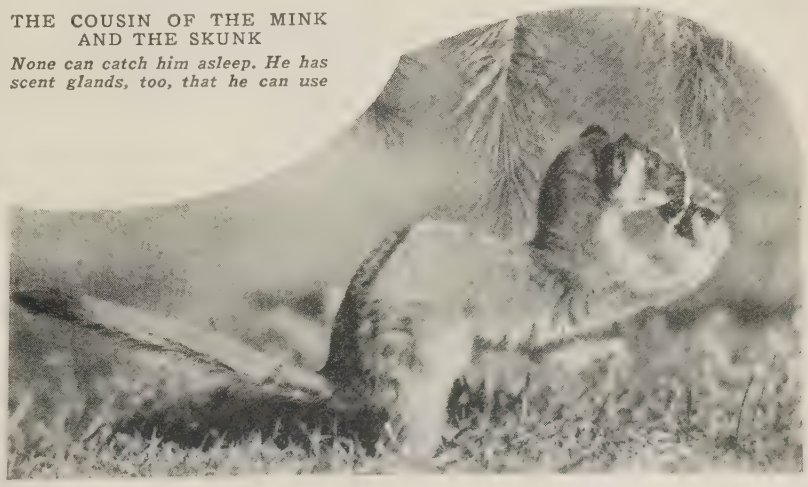
For upwards of two days that wheel was employed as a false means of escape. But at the end of that time our weasel began to associate food with the approach of the despised humans. Forthwith the desire to escape lessened, finally was lost, and now the wheel became something with which to play.

Just running straight ahead will do for play for a short time but there is something monotonous in running that never gets one any place so the weasel improved on this in several interesting variations. The spokes of the wheel on the inner side were wide apart and they presented a possibility: could he get his head in between them and out again as they went by without skinning his nose? Skin his nose he did at first, but shortly his head was bobbing in and out of those spokes as regularly as clock work while he ran and the wheel went around and around. But he did not stop with putting his head in and out of spokes. Shortly his whole body went through and then he presented, with his long slender, supple self, an epitome of gracefulness. Into the wheel he glided; down one quarter the wheel turned; out he slipped, turned, and passed in again. So in and out, in and out, until the regularity and rapidity of the motion looked like a continuous, spiralling brown ribbon.

So determined was he at the business of wheel turning that any obstruction in it made him angry. A pencil in the spokes would stop him, cause him a moment's annoyance in an attempt at running the wheel the other way, and would shortly be perceived. Forthwith the obstruction would be seized in powerful teeth, savagely tugged upon and chewed.

Once in the clean cool of a June evening in northern Illinois, on the homeward stretch of a long hike, I had

THE COUSIN OF THE MINK AND THE SKUNK
None can catch him asleep. He has scent glands, too, that he can use



heard a rustling in the grass beside the roadside ditch. There in the dusk I had seen, sitting bolt upright, the same little stiff bundle of weasel-curiosity that Charlie thought was "stuffed". I, too, waited motionless. Shortly the little fellow dropped into a nearby culvert and almost as soon popped out of the other end. A moment more and three or four youngsters emerged to play with each other like a family of kittens. They wrestled and tugged, leaped over each other, dashed through the culvert or stood upright to look at the gawky object that was I. In such a manner did our caged weasel play, making a foolish wheel do for brothers and sisters.

A weasel, since much of his time is spent in traversing tunnels of rats and mice, to the terror of all the inmates, must never grow fat. His welfare depends on a long, slender body. So perhaps the many hours of play accomplished a definite purpose in this respect. One who, in the snows of winter, has followed the perambulations of a weasel's spoor, must be amazed at the ground covered in a single night. Never have I been able to follow them to a certain ending. But our weasel did stop now and then his play in the wheel and curled up in sound slumber. He curved his body like a dog, turned around several times, and snuggled down in a neat little ball of fur with his black-tipped tail reaching almost around him, his head tucked in beside his hips. From sleep he arose with reluctance. Usually instead he pulled the excelsior farther over him with his teeth and cuddled down the closer when lights went on in the room.

One thing would drive away all desire for sleep. That was food. A squeak like a frightened bird brought him out in a flash, and he then looked our way, giving the only sound that a weasel seems to have, the peculiar sneezing sniffle. What an appetite! What voraciousness! Give him beef heart bit by bit and, hungry though he might be, he snatched it, drew it back and promptly returned for more, more, before eating a morsel. It is that downright savagery that causes the weasel to crush the heads of all the chickens in a coop before relenting. Much food he required, but only a parcel of that which he demanded.

Some house mice supplied were captured with such rapidity and adroitness that it was difficult to see just what had happened. The one thing certain was that sharp teeth had broken the neck of each in less time than one could say a word. Having done that our weasel left them lying and sniffed about for more.

We took advantage of the carnal spirit of our ever-hungry animal to secure his photograph. Beef heart on a string outweighed any thought of liberty when he was released on the court. About the bait he remained, seizing it, dropping it, always looking for more. Even the inviting tangle of nearby vines could not mean more than red blood and fresh meat. From the vines the beef heart lured while cameras clicked.

Yet after all a cage with wheels for chipmunks is scarcely suitable for weasels who must have blood. So after the photographs, we let him find a rat hole under the college and into it he squeezed. Now, thinking of anxious poultry ranchers, we hope that college mice and rats will satisfy. And that Charlie, with reluctant broom, sees again our "stuffed" weasel in the hall.

The GREAT SWALLOWER

by James N. Miller

THE BAY WINDOW in this great swallower is a temporary adornment, which will gradually disappear. It contains a fish larger than the consumer itself. The mouth of the latter is highly distensible and its stomach is almost as elastic as a toy balloon, enabling it to swallow its prey whole, meantime winding it up within its stomach into a neat coil.

A FULL STOMACH
The "bay window" is only temporary, however

When hungry, the great swallower looks much like an ordinary fish except that it is sooty black and has rather formidable teeth. Its habit of engulfing prey several times its size sometimes takes the form of cannibalistic gorging of its own kind. However, all things have a limit,—and the great swallower is no exception. Sometimes it tackles a food feast of such ample proportions that its demise is hasty and unheralded.

The great swallower first was discovered off Madeira at a depth of three hundred and twelve fathoms. Other specimens have been obtained near the isle of Dominica, and the British record discovering it in the mid-Atlantic at fifteen hundred fathoms. This particular fish, whose original is at the Smithsonian, is only nine inches long. Nor do its fellows get much larger.

Human beings live at an air pressure of about 15 pounds to the square inch. Down in the inky vastness where fish like this cavort, there is an added water pressure of one atmosphere for each thirty-two and eight-tenths feet. Even at the comparatively small depth of one and eight-tenths miles there would be a pressure of some two hundred and ninety atmospheres or more than two tons to the square inch.

How do these delicate fish withstand such terrific pressure? So far as their watery maneuvers are concerned, pressure simply doesn't exist. Their bodies are mostly soft and watery. Liquids are practically incompressible, so water-logged fishes such as throng the deeps are immune entirely from such a pressure threat.

HOME ON A CHIMNEY SLAB
The storks build great nests of sticks, from which the baby storks reach up their naked necks to survey the town

THE BLACK STORK

His Coat of Feathers Was His Only Offense

by Stephen Haweis

Illustrated by the Author

THE STORK, whose presence is sometimes suspected, is never seen by mortal eyes in the United States, but there are countries where it is a familiar sight, in broad daylight, on the roofs of a city or wading in the ponds and streams hunting for fish and the frogs which are its favorite food. The storks have very long necks, the length of which, added to their long yellow bills, is very deceptive, and a wise frog takes no chances; he jumps long before he can see the whites of their eyes. In fact the mere presence of a stork makes him feel jumpy.

The chimneys of German, Czecho-Slovakian and Polish houses are often covered with a broad slab of stone which the storks believe is placed there for their special benefit. They build great nests of sticks upon them from which the baby storks reach up their naked necks to survey the town until it is time for them to step off and flop from gable to gable, learning to fly. Storks are supposed to bring good luck and are regarded as fortunate omens in many parts of the world, but in Europe they are only summer boarders after all. In winter they go south, like millionaires, to Africa, to Egypt, where they are equally welcome. This habit has persisted among them from time out of mind, like the cut of their coats and the color of their red stockings. They are a conservative people who do not care for innovations of any sort, an orderly folk who have their own laws and abide by them.

As with us, ignorance of the law is no excuse for breaking it. Even if the fault of a transgressor is clearly

beyond his power to control, storks consider that the law is the law, and must be obeyed. And when storks say it, they mean it!

Among all animals, not excluding man, there are two color phases which are apt to occur and are known as albinism and melanism. A white mouse is an albino. It has red eyes and white hair because there is no color in its make-up to make them anything else. The red of its blood shines through its eyes, which, having no color of their own, cannot be black or blue. There are human beings born occasionally with red eyes and snow-white hair, and there are white sparrows, white crows, squirrels, and other creatures which are normally colored, though sometimes they have just enough coloring matter to make their eyes blue or brown. Melanism is exactly the reverse,—there is too much coloring matter. In the melanistic phase of a creature naturally white or colored, it is black all over. A melanistic robin might have a tinge of red on its breast, but most of it would be as black as a wicked thought.

It happened one day that a stork was born black on a chimney-top in a village near Prague. It was as black as if the soot from the chimney had leaked through the nest, but its brothers and sisters were just like everybody else, so it couldn't have been that. They were white, with black pinions, just as the Japanese paint them on a fan. There was a heap of trouble in that nest, too, over the queer little creature. Storks who lived twenty chimney-pots away came to look at it. The neighbors thought that a good swift poke with a beak would be the best thing that could happen to it, and a good sharp kick afterwards, aimed in the direction of the nearest ash-can in the court below, but its mother and father didn't think so. They hoped against hope that it might change, and tried to pretend, when they gave up hoping, that their son would became a second Booker Washington. But no, it grew up as black as it was born and was not remarkable in any other way though it became a handsome bird which many a museum official would have been glad to put in a glass case stuffed with wood and wool and wire. Nobody, you see, wanted it alive

AN OLD GARDENER WAS HOEING POTATOES

He looked up and saw an astonishing thing, the like of which he had never seen before

THE BLACK STORK ROSE

It mounted higher and higher until it looked scarce as large as a crow, and then . . .

and happy except the Director of the Zoo, and nobody told the family about him.

The black stork learned to fly very soon. It was agreeable, intelligent and well-dressed. Every feather was smooth, clean and well cared for and it was by far the best frog-catcher among the younger crowd of storks. And the neighbors said nothing unkind about it, or at least, not out loud. "If they like it", they whispered, "that is their affair: it is a family matter in which we need not meddle". Nobody attempted to do it any injury, but they thought a good deal and held themselves aloof from it. "It bodes no good", said the old birds of an evening, "however. . . ." And that meant that they would wait for the present and see what the future would develop.

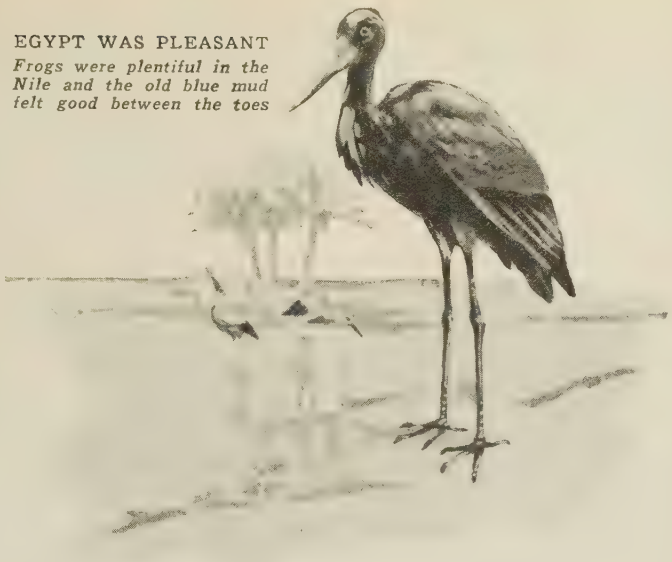
Then the time came for the storks to go south. Young and old waited until the word was passed around the roofs that it was their turn to start, and off they went, with no more baggage than they could carry in their crops and their long legs standing out stiffly behind, like an arrow on a weather-cock, pointing to the north.

Well, Egypt was warm and pleasant enough. Frogs were plentiful and the old blue mud of the Nile certainly felt good between the toes, but the black stork could have found a good deal to complain of if he had been that sort of a bird. He was sufficiently strong and well able to take care of himself in any company, and all the yearlings knew it, but groups of them would gather just within hearing distance and make wisecracks like: "Black mud and no frogs in it, huh"! And then they would all look at the black stork and giggle. If he struck at a fish and missed, they would all giggle again and shake their beaks or clatter them instead of looking the other way and pretending not to have seen it, which would have been more polite. In little ways they made his life a burden to him, but he was a good sport about it.

While they were in Egypt his father and mother could protect him, and sometimes they were forced to fight his battles, but the time comes when a bird must get out and stand upon his own legs, asking protection of nobody. That is the law. When the storks went back to Europe the birds born in the previous year began to mate and to build nests, but the black stork could not find a girl-stork who would stay long enough to listen to any talk of nesting. They clattered their beaks and screamed with laughter at the very idea. "Get some decent clothes before you talk to us about that"! they said.

At last the neighbors decided that something must be done about the lone stork. They decided to call a council

of the whole tribe to discuss what must be done with him, which is a thing storks do only when there is a matter of very great importance which concerns the whole people. They sometimes call a council when a criminally-inclined bird seems likely to become a public danger. It is generally so serious a matter that the death penalty is decreed, and when once that is decided upon there is no appeal, no long drawn out pleas and waiting; the prisoner is just beaten and pecked to death as quickly as possible. But the black stork was not a criminal and the case took a long time to decide. For and against, pro and con, everything which could be said was said, and every stork, young or old, who had something to contribute, was given a hearing. The black stork's fault lay in being black. Nobody had anything else to say against him. Ample time had been allowed during which he might have grown white feathers. They admitted that it was a difficult feat to accomplish and could not gainsay the fact that in every other respect the black stork was as good, and maybe a trifle better than most birds of his age. His conduct had been irreproachable and they were sorry for him, but the law against eccentricity in costume was just as strict and clear as



EGYPT WAS PLEASANT

Frogs were plentiful in the Nile and the old blue mud felt good between the toes

custom in America is on the same subject. However good a character one has, however skilful a fisherman, however kind and polite one may be, black's black and white's white, and it is not right to put one where the other should be. Every stork knows that.

The black stork spread his wings and tail sadly. "At least my wing feathers are the right color", he said, knowing well that his poor little defense could not help him. The crowd made no answer but ran together, enemies and accusers all, to hear the judgment of the King.

What was said in that final conclave no human being will ever know, but the old gardener who was hoeing potatoes in the vegetable garden a hundred feet below saw something very astonishing happen, something he had never seen a stork or any other bird do in all his long life among them. He saw the black stork rise and fly straight up into the air. Higher and higher he flew until he looked scarcely larger than a crow, when suddenly, the bird closed his wings in mid-air and dropped like a stone. The old man in the vegetable garden held his breath and smothered the sounds which came, but his eyes filled with tears. And he did not go to look at what he knew was there. He didn't want to see it.

STAY-AT-HOME LAMBS

They Shall Not Pass—Out of Sight

by Ethel I. Mason

EVER since the days of Mary Sawyer, it has been "the thing to do" for young, gay, innocent and gamboling lambs to follow someone, and they have followed to the slaughter as often as to the school. So the wise rangers of the U. S. Forest Service are tying such adventurous creatures with a good stout cord to a handful of wool on the backs of their fond mothers.

It is a wise lamb that knows its own mother, the first few days, for

"BAA, BAA, BLACK SHEEP

Have you any wool?" "Yes, plenty, and my prodigal youngster is attached thereto". This is the modern version

the youngster is very tiny, and very wobbly. As soon as it gets some faint glimmering of sense, and has learned to "run to mother" at the first hint of wolves, the lamb is graduated from the cord class to the school of "range-experience". Only real lambs are treated with these precautions, however,—the lambs of Wall Street and other localities have yet to adopt such methods for the protection they so badly need.

PHOTOGRAPHS BY ASAHEL CURTIS, SEATTLE

THE LADY OF THE SNOWS, MT. RAINIER, SEEN FROM NEAR THE SITE OF THE PROPOSED HIGHWAY IN YAKIMA PARK

Through quiet virgin woods, as beautiful as those pictured below, the new Naches Pass Highway brings the tourist from Yakima Station to the proposed National Park Service road which is to twine up to Yakima Park. Then it goes over the Cascades, past other great groves of trees, to Tacoma and Seattle. Will the people provide that the axe may never mar its roadsides?

OPENING YAKIMA

Shall the Roadside Virgin Timber Be Preserved?

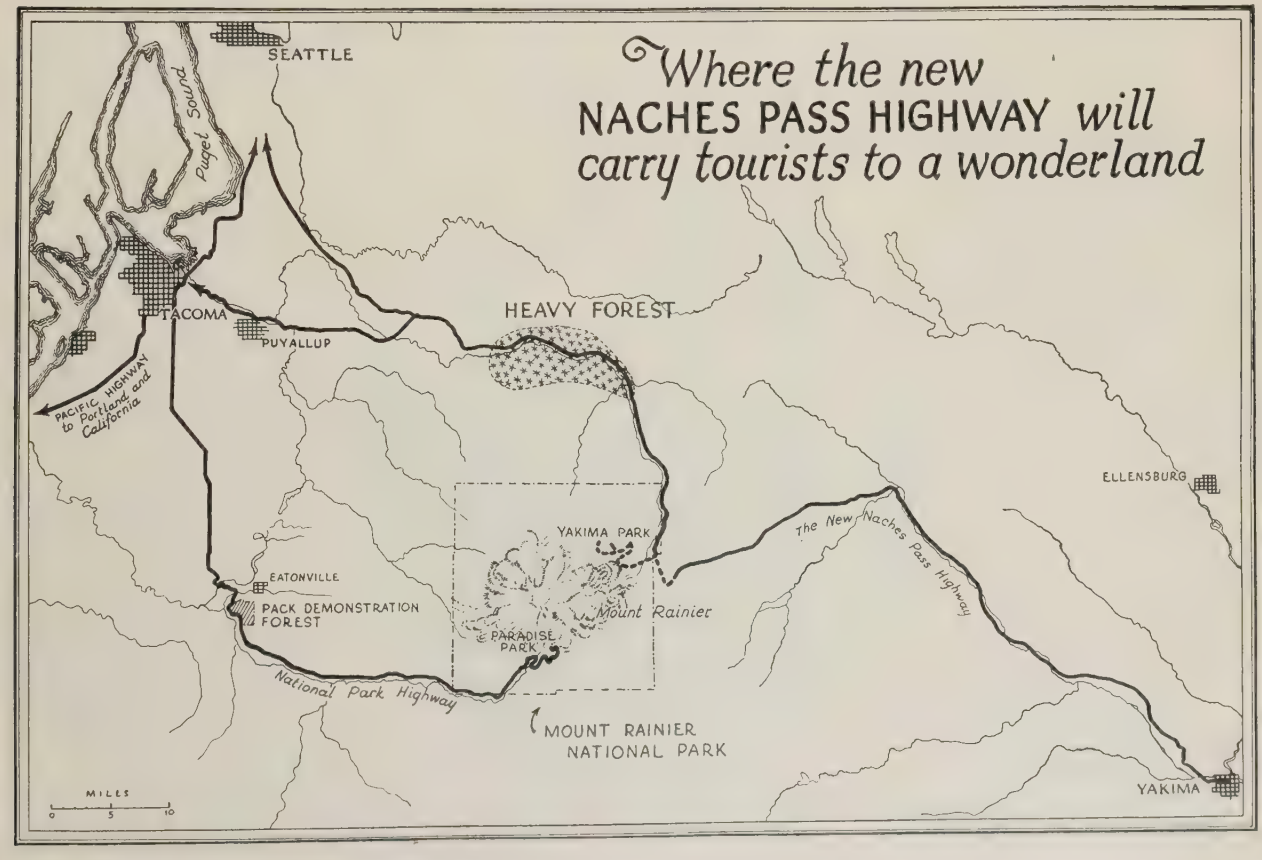
By Arthur Newton Pack

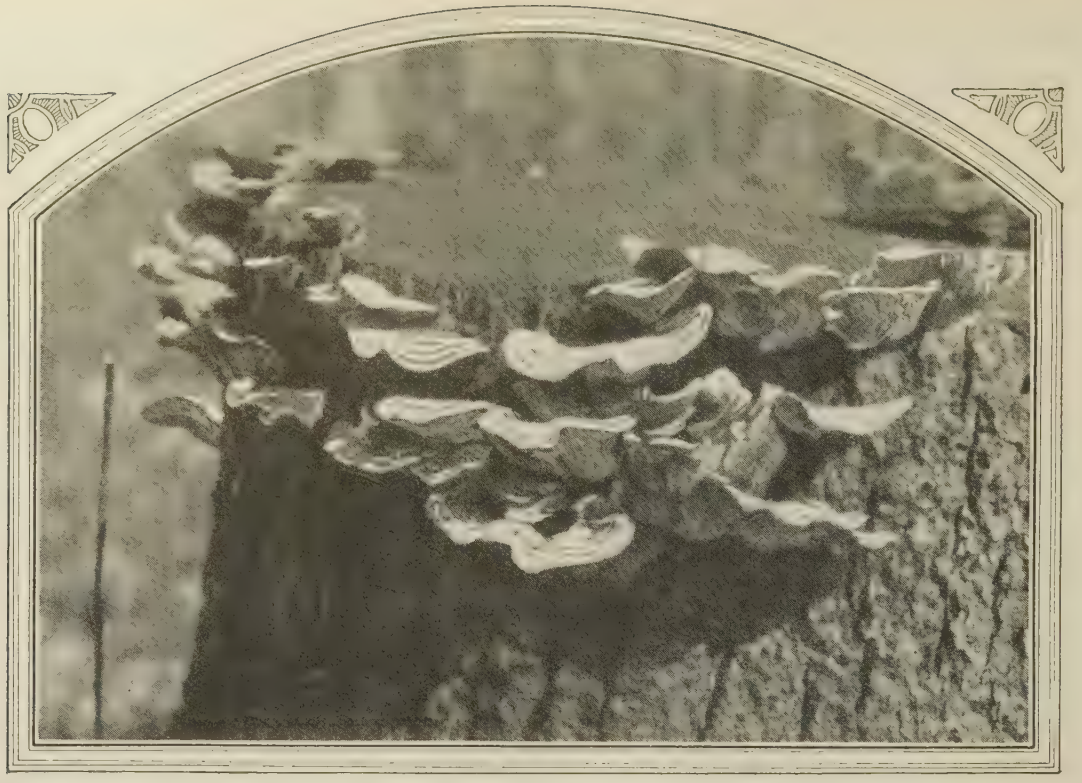
President of the American Nature Association

BY THE end of next summer the new Naches Pass Highway will be completed across the Cascade Mountains of Washington, making a through motor route from Yakima, on the Northern Pacific Railroad, around the north side of Mt. Rainier to Tacoma and Seattle. The National Park Service of the United States Government is building a road to connect with this new highway on the eastern border of Mt. Rainier National Park, and to run up as far as the beautiful sub-alpine valley known as Yakima Park. This valley is in every way the equal of the famous Paradise Valley, which is visited by thousands of people every year. There will be first-class hotel accommodations, opportunities for new and delightful saddle horse trips, hikes, and climbs. It is almost like discovering a whole new national park, but this one will be accessible directly from the east, as Mt. Rainier has never been in the past.

Leaving Yakima in the morning, one will be able to drive in one's car or in the busses of the Park Company directly to this new wonderland, spend the afternoon and night there, and next day—or the day after—drive on directly over the Cascades to Tacoma or Seattle. The road traverses miles of beautiful virgin forest, as yet practically untouched. In this feature the trip is unique—a thrill and a great experience in itself. The two more northerly trans-mountain motor routes offer today but ghostly reminders of the glories and beauties that have been. Through miles of burn and logging scars they make their way; and only within the boundaries of upper National Forests does green timber remain—and that for how long?

Here is a great opportunity. Here is still time to plan ahead and protect one link of a transcontinental route by preserving a belt of timber along the most beautiful portions of the road. It may be expensive, for timber is valuable, and experience shows that it is necessary to leave a sufficiently wide strip to prevent blow down. Yet it can be done if the people of the country so desire and will let their wishes be heard where legislators dwell. The finest forest scenery is to be found directly north of Mt. Rainier in the area shown on the accompanying map. The timber belongs in part to the Northern Pacific Railroad, which would unquestionably be benefited by this new tourist link, in part to large lumber concerns, and in part to the National Forests. Now, the primary purpose of the National Forests, which purpose should receive the support of everyone, is the growing of timber for our future needs, not necessarily to protect it for scenic purposes. Nevertheless, if the State of Washington should appreciate the importance of maintaining the scenic beauties of this highway and would acquire a strip of privately owned timber in the shaded area and west of Greenwater, it would doubtless be both possible and practical to bring the desired belt of National Forest timber into line.





LUSTY BRACKET FUNGI GROWING ON AN OLD STUMP
They are using the woody substance for their own food and reducing the stump again to earth

FUNGI and the FORESTS

They Cause a Tremendous Drain Upon Our Timber

by F. F. Franklin

THE average man has a vague conception of the various forms of fungi. He has a lesser idea of how they affect his every-day doings. Little does he realize that they are linked up with his very destiny by bonds which, although hidden, are nevertheless infinitely strong.

Commonly, we think of three fungous types. The toadstool, that form which is so often held in awe by many of us, is probably the most common. To a second group we give the name mushroom. We think of this name in terms of an edible plant. The bracket or shelving fungi complete the group of three. This form, appearing on trees and structural timbers, is usually thought of as associated with decayed wood.

HOW FUNGI WORK
Micro-photo of "quarter-sawn" pine showing hair-like fungous growths feeding on the wood cells

Little do we realize that this third form of the fungi really causes the rotting of timber. Knowing that such is the case, it is yet beyond our conception to measure in terms of dollars the devastation that it causes. It has been conservatively estimated that twenty per cent of our utilized timber is destroyed by the various forms of bracket fungi. Thinking of fungi in reference to timber conservation, it means that out of every five trees cut for use, one tree goes to replace wood

that has uselessly been allowed to rot. Decay, or rot, causes almost as big a drain upon our forests as our combined disastrous forest fires and structural timber fires. About the only difference between fire and decay is that the work of the tiny plants which cause decay is so inconspicuous as compared to fire that we do not notice its ravages until completed.

As devastating as these fungi are, we cannot get along without them. Fungi are plants that, unlike our common higher plant life forms, do not bear green coloring pigments. Not only are they plants but they can very correctly be called plant scavengers. If it were not for these simple plant forms that dissolve or eat higher plants when they die, the world would soon be cluttered with dead higher plant forms. Our forests would be a score or more feet deep in leaves, twigs and logs, if we did not have these simple types of wreckers to tear them down and use them for their own food. Their close association with the destruction or decaying of other plant life and the mystery surrounding their sudden appearance, as well as disappearance, has caused them to have romantic tales woven around them, yet they are commonplace natural objects. Since they differ so materially from our popular conception of a plant, it is interesting to compare them, part by part.

DEMOLISHING A RAILROAD TIE

Polystictus versicolor *at work. Untreated ties last about five years, treated ties twenty*

The bracket or shelving type of fungi is the one so destructive to our forest. The conspicuous shelf or bracket acts merely as the spore-bearing or seed-like part of the plant. It compares with the stem, branches, leaves and seed-bearing parts of a higher plant. It is composed of countless thousands of tiny hair-like structures called hyphae. These tiny growths are systematically and definitely arranged. This gives various wood-destroying fungi brackets a characteristic form and color.

Due to the fact that these tiny fiber-like growths do not contain the green pigment that is common to the higher forms of plant life, they are not capable of manufacturing their own food. They must then use food that some other plant has made. The bracket fungi, through ages of adaption, are capable of using only the food that has been manufactured by the leaves of trees and stored in the form of the woody tissues of our ordinary lumber.

An abundance of moisture, relatively high temperature, sufficient air and sufficient wood from which to secure food are conditions which aid them. This accounts for the abundance of bracket fungi appearing on warm days following a period of rainy weather in the summer.

From the gills or pores on the under side of these brackets, millions of seeds or spores are thrown out into the atmosphere. They are carried sometimes for great distances and only a limited number of those that fall on wood live to produce a new individual plant. Sprouting and growth is accomplished by the spore sending out a tube that, under favorable conditions, penetrates through the tiny openings of wood in search of its choice food. In securing this food, the fungi tube first sends out small bodies called enzymes. These enzymes have a chemical effect upon the wood substance and reduce it to a solution that is absorbed by the rapidly-growing tube that grew out from the tiny spore or seed. Under these favorable conditions, the tube grows and branches, forming a network of tiny strands ramifying the host wood. In some instances fungi, through the actions of the enzymes, may dissolve and absorb seventy-five per cent by weight of the woody substance. By this action, of course, the body and strength of the wood is impaired beyond further use. The work of the part of the fungi growing in the woody substances compares with the root system of a higher plant. It is, indeed, a root-like structure and secures food material from the host wood much the same as the root of a higher plant obtains water and certain chemicals from the soil.

When the tube has branched considerably, a section of the wood is well filled with this network of hyphae and the fungus soon becomes gorged with food material. The over-absorption of food material causes the strands of hyphae to converge at a desirable place on the side of the post, log or timber. At the point of convergence, a small button or knob is first formed on the outside of the particular timber. This knob or button of compact hyphae gradually begins to form into a well defined and regularly-formed bracket. Four or five generations may be produced in one season, depending upon conditions. The rate of destruction also varies with conditions. As the wood becomes entirely disentegrated and there remains no more food material, the fungus growth withers and forms resting spores that are scattered to new locations.

To be sure, the action of the various wood-destroying fungi upon waste lumber or upon limbs, twigs and stumps in the forest is very desirable, but, unfortunately, fungi do not appreciate the difference between wood that is being used by man and that which man

wants destroyed. Fungi are as harmless as fire if kept in their places, so the thing for man to do is to keep the wood-destroying fungi in place. In the past, this has been accomplished by treating wood with oils, creosotes and metallic salts. These preservatives impart to the woody tissues certain chemicals that when absorbed by the fungus, prove to be toxic to it and result in death to the growth.

Some woods are used in places where conditions are the very best for fungus to grow, as in contact with the ground. Railroad ties and fence posts are good examples of this. The railroads are spending millions of dollars annually in the crusade against fungi. With a better understanding of the inherent properties of wood, as well as the various fungous growths that destroy it, the general public will do much to conserve our nation's timber supply. The conservation of our present stand of timber must, therefore, be pressed to the very limit, and consequently, there will inevitably come a time when fungus attacks upon structural timbers can no longer be tolerated.

ATTACKING A LIVING TREE
Wounds in trees make them liable to infection that will kill them

Although the bracket fungi may have no attraction to the average layman, yet in view of their destructiveness, there should be sufficient inducement for him to learn more about their life habits. It is only in this way that we can hope to apply intelligently the various control measures, the finding of which is absorbing the whole energies of many investigators. The result of their investigations and the practice of treating timber in such a way as to ward off the ravages of fungi results in a natural decrease in the drain upon our forests and the cause of timber conservation is greatly aided.

The PEREGRINE FALCON

by Edward A. Preble

SEEN circling about its nesting site on lofty crag, or near some rock-towered edifice which it has chosen for its winter rendezvous, this noble bird commands the eye. Easily may we understand how the devotees of falconry, that noble sport whose origin is lost in the maze that pre-dates the written word, so esteemed this bird that it yielded first place but to the gyr-falcon, and that only from its lesser size,—for in keenness of eye, in dauntless courage, and in speed, the Peregrine is unsurpassed. In Britain, where falconry reached its height of development, none of rank lower than an earl might possess a Peregrine.

Our duck hawk, the American Peregrine, differing from the Eurasian bird but slightly, and nowise to its discredit, chooses mainly for its nesting ground the boundless stretches of the subarctic wilderness watered by the mighty Yukon and Mackenzie, and the affluents of Hudson Bay. There, on the rocky cliffs that overlook those broad valleys and clear blue lakes, its young are reared and trained. Southwardly, indeed, where aeries to its liking may be found, it resists persecution to this day, better satisfied to bring to maturity only an occasional brood than to forsake a site claimed by its forebears for thousands of years. Even in this age of materialism, when scant respect is paid to tradition or worth, and the price of a charge of powder looms larger in our scheme than the life of one of Nature's choicest creatures, the Peregrine, by virtue of its strength of brain and body, yet survives.

Thus it is that even we of the cities, if so be our eyes are open to Nature's secrets, may still have sight of these noble birds. Choosing for their winter home some lofty tower of stone, frequently in pairs, they sally forth daily to the wilder haunts about for their food. At times, returning at night unsatisfied, they take toll from some flock of city pigeons whose flight, albeit swift, is laggard indeed when forced to match itself against the falcon's lightning swoop. Often in the later years do these noble hawks deign to satisfy their hunger on starlings snatched from the swift-circling flocks, thus adding usefulness to the debt which their beauty and strength have scored.

May we not well spare from our abundance enough of their chosen food to support the few remaining, that we may glimpse, even rarely, one of these noble falcons, the embodiment of strength and speed, thrilling us with his boldness, and bearing to us through the slow-creeping years the romance of a nigh-forgotten age.

FROM TARPON SPRINGS TO TUB

by Donald C. Peattie

As you toss your bath sponge into the gleaming waters of your Saturday night ceremony, you may recollect that the funny, elastic and buoyant object was once a living animal. But unless you have recently been playing the Florida real estate market and have been to our great sponge fisheries, you may not know that what was once an entirely foreign trade has become a romance of American enterprise—the wonderful Florida sponge industry.

Ages before the New World was discovered, diving boys of the Mediterranean were plunging in those blue depths for sponges, and to this day the most famous fisheries of the kind are those of the eastern end of that land-locked sea, from the isles of Greece to the shores of the Levant and along the Barbary coast, from Tripoli to Tunis. The Red Sea, too, is celebrated for its antique sponging industry and most of the warm waters of the world can boast a submarine sponge garden.

In fact, our common bath sponges give us little idea of the marvelous variety of shape that sponges may assume. There are sponges so tiny that they can only be seen with a microscope, and sponges so big that they several times exceed a man's head in size. Some of them are of the most intricate and marvelous beauty, which only the dainty symmetry of snow crystals can rival. Such are some of the exquisite Euplectellas that are in outline like graceful cornucopias, of elegant open-work pattern. Such fragile beauties have, of course, no use for humans other than to delight us. And in fact of all the vast tribe of sponges only a few are of any value to man. And the more useful a species of sponge is the more it would seem to lack real grace of form. But this is very often the case.

U. S. BUREAU OF FISHERIES

A SPONGE SOMBRERO

Sponges come in many sizes and in varied shapes, like hats

The commercial sponges lack any definite shape, due to their habit of branching and "budding". It was this habit, which seems more vegetable than animal, combined with the fact that they are often definitely fixed to a rock or the floor of the sea and appear to be rooted, that led even very wise men like Aristotle to think that sponges were plants. The Greek soldiers who put sponges under their hot heavy helmets undoubtedly thought of them as vegetable growth, and only the microscope has proved that they are members of the animal kingdom.

Their animal natures are more apparent if you have ever seen a sponge alive. To touch its slimy surface or smell it in its decaying state convinces you that the sponge is no fragrant bloom of the sea, but that it has an unpleasant if superficial resemblance to a jelly-fish —with a sort of skeleton inside it.

What we use for sopping up water is only the animal's skeletal structure, around which and in which the soft, living, fleshy part of the animal once clung. The skeleton in some sponges is made up of calcium, in others of silicon or sand, but in our bath sponges it is a sort of horny material of which silicon forms a part. This horny matter bears some chemical resemblances to silk, which is perhaps why our bath sponges feel soft and pleasant and are pliable and elastic instead of being brittle and scratchy like those sponges that have crude limy or sandy skeletons.

When you sop up water with a sponge and then shoot it out of the intricate canal system by squeezing the sponge, you are doing something not unlike what the living sponge does when it feeds. Through tiny openings it sucks in water by means of countless little whip-like structures, and with the water any food particles are circulated through the sponge's canal system and absorbed. From big openings the surplus water is again shot out in a strong stream. This eating process and growth and budding and reproduction are the sponge's life work. The sponge can cease feeding "at will", and though a sponge has no conscious volition, it is in some way able to control the beating of its whip-like hairs and the opening and closing of its mouth-like pores.

Long before Americans realized the value of our spongeries, the Cubans had seen the worth of the Bahaman sponge industry and made the shallow waters of Andros Island famous by their sponging fleets. But as the west coast of Florida became popular as a resort, enterprising men saw their opportunity to exploit a great natural resource, and so today the spongeries of Tarpon Springs and Key West stand unexcelled. But therein lies a story of warfare.

Until a few years ago the spongeries were fished

U. S. BUREAU OF FISHERIES

THE SPONGE FLEET AT WORK

Present methods of gathering these animals of the waters came about only after a warfare between two schools of spongers

entirely by "Conchs", which is Floridian slang for fishermen, in this case of Cuban extraction. Real conchs are beautiful shells of the Florida sea-beach, and some indeed are called fighting conchs. But as it proved the human Conchs were not equal to the contest before them.

For years the Conchs had had everything their own way on the sponge banks, and no one thought of trying to better their methods of fishing. In small craft the Conchs sailed across the waving, coral-tangled marine gardens where grow the sponges. One man took the rudder and the other leaned over the side with a long pail having a glass bottom, through which he peered for his prey. The purpose of this primitive spy-glass was to get rid of the deceiving effect of the waves and the light refraction at the surface. When the Conch saw a fine sponge specimen he yelled out to his companion to steady the boat, and then, grasping an unwieldy thirty-foot pole with a hook on it, he stabbed at the sponge to tear it from its moorings. If he missed he stabbed optimistically again.

A few years ago by chance a Greek boy, John Corcoris, was in Florida and got a job in the sponge fisheries. He was very scornful of the clumsy tactics of the Conchs, but nobody paid any attention to him. Next year four or five countrymen joined him and after that many more. Presently, to the annoyed surprise of the Conchs a little fleet of Greek ships was sponging on the Conchs' sponge business. The Greeks, trained spongermen for centuries, are marvelous divers and harpoon throwers, and so thorough were their methods in this case that in a few years they had driven the Conchs off the seas.

Only once did the Conchs show fight, when they burned and scuttled several Greek sponge ships while their owners were on shore for the evening. The Greeks were too crafty to retaliate, and by persistence and industry have gone right on gobbling up the sponge fishing of the Bahamas and Florida.

There is nothing difficult about the preparation of sponges for the market. They are thrown into the hold of the big boat from which the dingies put out, and there, amidst horrible smells, the gelatinous parts of the sponge ooze out and decay. The sponges must then be cleaned of sand and beaten, and are then strung up in picturesque festoons to dry and bleach.

Sponges, of course, are graded. There are sponges and sponges,

TARPON SPRINGS C. OF C.

HARVEST FROM THE OCEAN BOTTOM

The little fleet of these Grecian spongermen captured the Florida sponge trade from the "Conchs"

soft and elastic ones, stiff and gritty ones. The best of all and consequently the most expensive, among our Florida sponges, are the sheep's-wool, which surgeons use for stopping wound bleeding and which we use, in larger pieces, as the best bath sponges. There are, besides, the yellow sponge, the grass sponge, the velvet sponge, in decreasing worth, and finally the big rough glove sponge which is useful chiefly for swabbing decks or in the painting trade.

So fast have grown the sponge fisheries of Florida that in a quarter of a century the output has increased by twenty-five per cent. There is a reasonable fear that sponges might be exterminated, that they might need legal protection quite as much as game birds or forest trees. Not that sponges do not grow again with rapidity, but that the destruction of young specimens threatens the continuity of the supply. Most wisely has the Bureau of Fisheries at Washington put reasonable restrictions on exploitation of sponges.

Science too has come to the poor sponge's rescue. Through the work of men like Dr. H. F. Moore of the Bureau of Fisheries, the cultivation of sponges is now a practical accomplishment. Just as the twig may be cut from a willow and planted, so cuttings of the "buds" or branches of the bath sponge will grow and live separately. Marine gardens of sponges have been established in quiet lagoons of Florida where there is a steady current of water but no danger of an influx of fresh water from rivers, which would be fatal. Stone or concrete bases are used on which to root the cuttings, so that the sponge may be easily removed when the time comes to harvest it. It is even proposed that the sponge eggs might be saved and hatched, as fish eggs are. In any case real danger of exterminating this fascinating and useful marine animal seems removed, even though wholesale dredging of the ocean bottom is sometimes practiced.

ANNA E. ALLEN

A PHOTOGRAPH OF A SPONGE GROWTH

When you indulge in the solemn Saturday night rite, pause a moment to consider the origin of the bath sponge

Your frowsy, dishevelled-looking sponge resembles little a thing of romance as you watch it soak and lazily fill with water. It hardly suggests lithe, dark-skinned bodies clinging to a great stone on a rope and shooting downwards through blue Mediterranean waters to pluck it from the ocean floor. It may have come from the West Indies on the dark bottom of a fishing boat; perhaps the Grecian Archipelago, or Crete, Cyprus, or the shores of Asia Minor yielded it up,—there are no labels, unless you are a sponge expert, to tell you. If it is of fine enough quality you may suspect that it was some Turkish lad who severed it from the rocks three fathoms down, or imagine that perhaps in the days of its youth hulls of Barbary corsairs cast temporary blackness over it as they passed into hidden ports. An inert, shapeless thing, it gives no intimation that battles may have been fought over the possession of it. For after all, it is only a sponge, one of the lowest of animal forms, and while it may have soaked up adventure woven around its life, it has nothing to give back, except water-service.

TARPON SPRINGS C. OF C.

HAGGLING AT THE SPONGE MARKET

In the piles are the fine, or sheep's-wool sponges and the coarse ones known as glove sponges

Maryland's Black-Eyed Susan typifies the Old Line State

The Magnolia is State Flower of Mississippi

The Daisy and Goldenrod are Rivals in North Carolina

In Tennessee, the Passion Flower is Honored

The Rhododendron, West Virginia's "Favorite Son"

IT MAY *be that the final selection of the people for National Flower will be taken from the ranks of the State flowers. Here are a group of eight, caught in executive session in the heart of the Southland. Other "favorite sons" will appear in future issues to help the public choose. These photographs are by C. W. Johnson of Springfield, Massachusetts*

Virginia's Dogwood Has Long Been Famous

The Pretty Cherokee Rose of Georgia's Meadows

Alabama Is One of the States in which the Goldenrod Holds First Rank

WHERE IS YOUR BALLOT?

Flower Candidates Make Appeal for People's Vote

Please send returns to the National Flower Editor, American Nature Association, Washington, D. C. A sample ballot will be found on page 6. Limited numbers of bulletins containing information and ballots on the National Flower Poll will be sent to teachers and club leaders, on request.

Now is the time for all good men to come to the aid of their party. Now is the time for all flower lovers, whether men, women, or children, to rally to the standards of their favorites. For the National Flower campaign, originated three months ago by the American Nature Association under the slogan, "Get Out the Vote", to enable the American people to select a suitable floral emblem, has raised turbulent issues in the world of nosegays, and conditions will not quiet until the last vote is in, until the nation has made its choice and a national flower takes its place beside the national bird, the bald eagle.

Though the columbine to date has lapped the field and has a two to one lead on the nearest candidate, no words of discouragement come from the campaign headquarters of the other aspirants for national honors. Whirlwind finishes are being relied upon to put them in front, and the early success of the red, white and blue favorite son of Colorado has served only to spur those supporting other candidates to greater effort to get out the vote, in all sections of the land.

C. W. JOHNSON

DEMURE MORNING GLORY

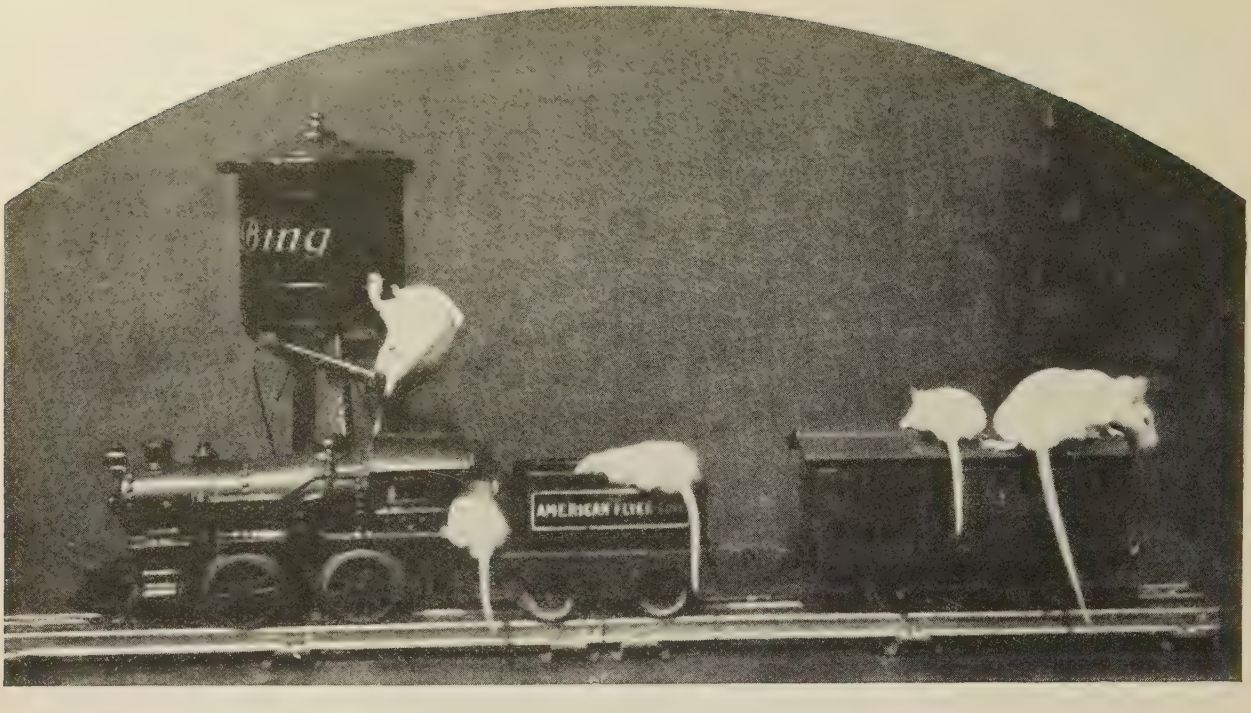
The candidate nominated by the Cincinnati Enquirer *and supported by the Louisville, (Ky.)* Times *and others. Will it win?*

New candidates are popping up like mushrooms after a rain. The Cincinnati *Enquirer* nominates in glowing terms the modest morning glory, and the Louisville (Ky.) *Times* seconds the nomination by saying: "It inspires the orator, the poet, the painter. It pleases the plain, unvarnished individual who is content to look at it and wary of attempting to describe it." The bluebell, tulip, forget-me-not, and lily of the valley have become other seekers after glory because of the votes of their friends.

The National Flower referendum has awakened new interests in all parts of the country. The school children especially are flocking to the polls to cast what is for them their first ballot on a national question. No teacher has been found to deny them the right to take part in this campaign, and unless adult votes increase considerably, the selecting will have been done by the children. Educators find that the timeliness of the poll acts as a stimulus in more than merely Nature study—it is incorporated into programs in classes in reading, biography, history, where the relation of the flowers to the pioneers is brought out, and in citizenship. This is a good sign. If the poll functions as a means of inculcating into the youth of the land a love for the natural flower heritage, if it helps create a desire to conserve and protect that heritage, it has amply served its purpose.

Eager workers are carrying the fight the poll has engendered to the people, calling upon them to vote. Mrs. George McDonald and Mrs. M. S. Thompson are fast delivering the vote of the Buckeye State, and in Illinois, members of the St. Charles Garden Club are scouring their field for ballots. The five hundred delegates of the annual meeting of the Cooperative Education Association of Virginia not only expressed their opinion, but carried the campaign back with them to all parts of the Old Dominion. When the Girl Scout executives met in Colorado in October, they took up the matter of the poll, and as a result the girl scout vote rivals that of the schools. The eight hundred and fifty members of the Round Table Luncheon club of Kansas City, Missouri, under the leadership of Mrs. George Welsh, president, and Mrs. M. J. Patterson, citizenship chairman, point the way in the "Show Me" state by sending letters to all civic organizations, schools and clubs, urging them to vote and to help get out the vote. Mrs. Fritz Jones, chairman of publicity for the Garden Club of Georgia, has started the movement to register Georgia's opinion by soliciting garden clubs, students and citizens for their ballots. With such groups cooperating in the field there can be no excuse for refusal of suffrage, and no moaning at the bar of justice after the returns are in.

The nation is "safe" for another four years, in the minds of the majority who voted November 6. Now the thoughts of the citizen can turn to other candidates and platforms; he can judge for himself without listening to speeches or consulting his ancestors. His eyes are to focus on flower form, on symbolic colors; he can quietly hear the conservation message the poll carries. And his ballot will help select, at last, a national floral emblem.



THE TRAIN CREW PUT EVERYTHING IN READINESS
Not a one of these white mice allows a single thing to escape their attention

WHITE MICE

Cleanliness is Their Goal, and Curiosity Their Chief Trait

by Rhea Kimberley Johnson

Photographs by Charles A. Johnson

White mice are adventurers. They journey up, up where the blue begins, with balloonists and aviators, to register the slightest change in air conditions. They have crept for years along the ocean floor in U-boats and submarines, scarcely conscious of the close-pressing mass of water which is kept from them by only a thin steel shell. They climb snow-laden freezing peaks with mountaineers; they invade biological laboratories to be bred and examined by eager, thoughtful scientists. But our white mice, whose home is a grocery box near the fireplace, do not care to roam as their brothers do —why should they go adventuring when food, drink and a cosy nest are always waiting for them?

Perhaps they promenade along the edge of their box to see the world, or perhaps the towering Titian gods who are Dispensers - Of - Everything remove them to new lands the length of a room away; but they soon climb down into their house again, glad, like a New Yorker returning from Yonkers, to see familiar things once more. They are very, very busy at home, anyway—why should they leave? There are the newspapers to tear up, to line the cigar box nest; sometimes this takes all night, and then the Jupiters are apt to reach down from Olympus and empty the cosy chamber, so that task has to be done over again. And there is the washing. One must keep clean. Several times a day they perform their ritual, first washing their bodies, and then rubbing their forefeet,—so much like tiny hands,—over their heads as if giving themselves a shampoo. If cleanliness is next to godliness, as the soap advertisements say, then Plato was indeed wrong, and our animals have souls at least. Even the

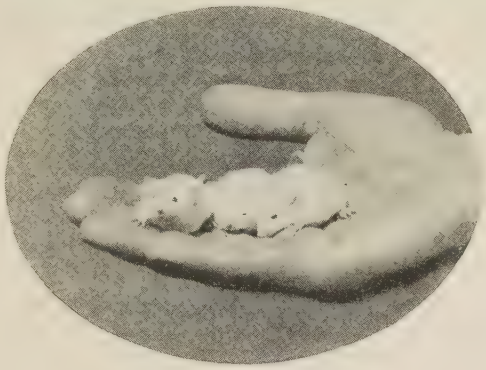
FILLING THEIR MISTRESS' SHOES
Like Mother Goose's old lady, the owner of these mice found many children a distraction

CURIOSITY
Killed the cat. But it gave the mice a good time

WHAT'S THIS?
They did all but pull the shutter while investigating

young members of the white mouse family scrub continually. When they were such small babies that their eyes were not open they endeavored to wash their own faces, implicitly inferring that their frantically-working parents were not doing a good job.

Though she resembles the old woman who lived in the shoe in regard to the number of her offspring, mother mouse does not spank them and put them to bed. She seemed to love them dearly even when they were first born, red, hairless, blind and with their ears so tight to their heads that they could scarcely hear. She nursed them until they were three weeks old when they began to sample the bread and crackers that their parents were nibbling. When they were tiny and helpless mother mouse was so nervous about them that she would gently take them in her mouth, one by one, and hurriedly pull them out of sight under the nesting material if curious humans opened the box.



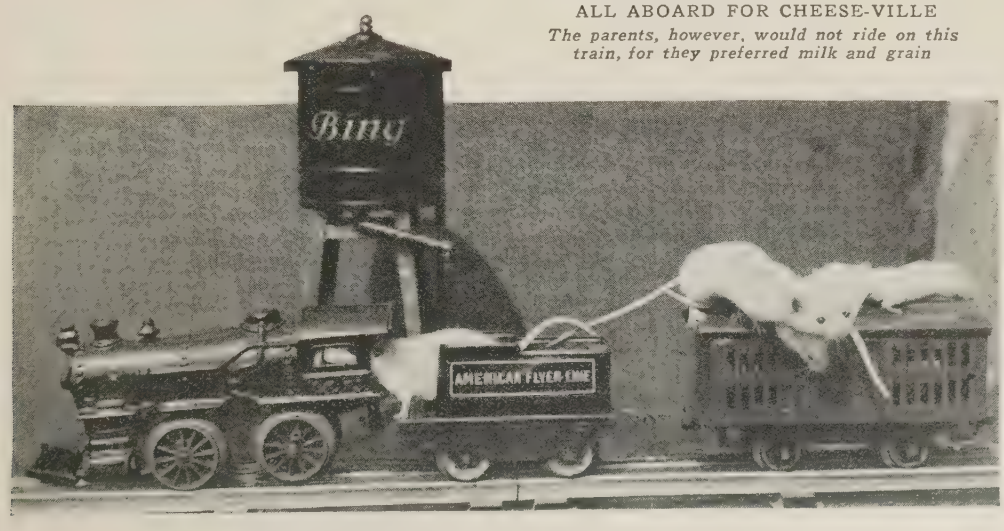
FRIENDLY AND CLEAN
Humans were their protectors, and they accorded them privileges—when they weren't washing

Father mouse did all he could to help his spouse care for the children. He is a great little housekeeper, and many a human father could learn about house work from him. When the young ones were small he was constantly fussing up the babies' beds, and pulling pieces of cloth and paper over them to keep them warm. He would grab one baby after the other, hold it down gently and wash it all over. When *mater familias* went out of the nest for food he would stand over the little ones and tuck them under him to keep them warm, like an old hen brooding over her chicks. How many human fathers show such solicitude?

Of all the mouse children Marshmallow Mouse —he's Marshy for short— was the most precocious. He enjoyed leaping into human hands when they were held down to him. One day, after jumping into a friendly hand, he found himself on a little table. He ran about investigating everything. He peered over the table's edge on all sides but found it too high to jump down. He clambered over some books; nothing of interest there. Then he came to a small, Chinese jar. It was round and cozy—just the place for a nap. But it was filled with pieces of wood—burnt matches. He set about to get rid of them and make room for himself. There were twenty-seven burnt matches in the jar according to the count of the Brobdignagians. Marshy was only five weeks old and not very large; a match was quite a log to him. But cheerfully he began his task. One by one he took those big, wooden matches in his teeth, and with the assistance of his fore-feet, heaved them over the side of the jar. Some of them, at least nine or ten, fell back again. Was Marshy Mouse down-hearted? Hardly! With a stout heart he tugged and pulled until they followed the others. In less than fifteen minutes the jar was empty. Then Marshmallow Mouse curled up in the bottom of the jar and took his well-earned siesta.

Snowball was in many ways the most individual of all the white mouse brood. She was more venturesome than the rest, she climbed more often to the top of the box and viewed the great, outer world, that, like the one of Mr. Vivola, was flat. Many times her mother had cautioned her not to lean so far over the edge but she

ALL ABOARD FOR CHEESE-VILLE
The parents, however, would not ride on this train, for they preferred milk and grain



paid no heed. One day, as she was precariously perched on high, a dog in the street barked. This so startled Snowball that instead of jumping into her home she jumped out. At first she did not mind. She ran gaily about. There were many new objects to investigate. It was good sport to race back and forth across the big studio floor. At last she dashed heedlessly into the fireplace. Fortunately the fire had gone out; but there were ashes. Awful stuff! The ashes got into her eyes, and how they did smart! She couldn't see where she was going so she lay down behind a half-burnt log. It was warm there; she became nonchalant, and soon fell asleep.

When she awoke she was dreadfully hungry, so hungry that she didn't think even about washing. She could scarcely see but she crawled out towards the light. She heard some one of the Gargantuas say in a stentorian voice: "Oh! Look at the poor, little mouse. Why, it is one of the white mice and it has been in the ashes".

Then Snowball found herself back in her old home. But her troubles had only started; her own parents did not know her. They thought she was a common, house-mouse invading their domain. They rallied to the common defence. They bit her! How Snowball did squeal, but her cries for mercy had no effect.

JUST SNOOPING AROUND

Something must be going on inside, and we want to see what it is

Her human friends rescued her. She heard someone say, "Let's give it a bath". And soon she found herself in a basin of warm water. She was terrified and swam for dear life. Next she found herself in a box full of soft warm cotton. This was better. There was bread and milk to nibble and drink, and one can always sleep.

When she awoke this time she was dry and slightly whiter but still far from being a respectable-looking white mouse. Again her human friends placed her in the bosom of her brood, and this time she was recognized. They were disgusted with her, however, she was a disgrace, the black rodent of the family! So, one and all, father and mother, brothers and sisters, gathered about to help clean her of the contaminating touches of the world. How their little pink tongues flew as they washed and washed! They had to stop to rest, to eat, to drink, or to wash themselves, but always returned to their self-appointed task. By the next morning Snowball could again claim her name.

Though cheese is the proverbial food of mice—as many a one has found to his sorrow—the parent mice will not touch it. Indeed the family shows a marked individuality in taste. Some like one thing and some another. Their menu consists of bread, meat, grain, seeds, crackers and milk. They all proclaim, with one accord, that fresh milk is the best thing on the menu. They always find milk in a little, blue bowl which was originally intended for a doll's tea-party. And no group who ever gathered around a bowl, festive or otherwise, could ever be more interesting than they when hunger calls.

Father and mother mouse are quite different in temperament. The lady is sedate and cautious; she peers over the edge of the table carefully and then draws back; she takes no chances. She seems indifferent to fondling by human hands, perhaps because she has family cares on her mind to the exclusion of all other matters. Father mouse will dash boldly along the table's edge with no thought of fear. He seems to enjoy being stroked gently on his head and back and having his ears rubbed. He is a friendly, rollicking fellow, with a fine sense of humor, a love of family, and great inquisitiveness.

One day his boldness got him into trouble. He found himself on the top of a high cupboard. His human friends have a way of placing him on strange objects to see how he will act. There was an envelope at one end of the cupboard that overhung the edge. Curious as usual, the brave mouse stepped out onto the envelope. His weight over-balanced it and it performed a nose dive to the floor with him clinging to it. It was his first experience in aviation, but only his dignity was hurt.

Insatiable curiosity is a trait strong in every member of the mouse family. When placed near any object they go over it carefully, examining every detail. They examined toy trains, the toy house and even the camera with great care; they go everywhere and see everything —they would make good reporters or investigating detectives.

The parent mice have traveled extensively. Last autumn they motored every week-end to the country. One Monday morning, while in a traffic jam on Fifth Avenue, Mrs. Mouse decided that she was too warm. She managed to crawl out of the cigar box in which she was traveling and sat upon the top if it, in plain sight of the people in the cars about her. If some timid lady-driver had happened to see her there might have been one more accident on the Avenue that morning. Her individualism, however, was quickly suppressed, and back to her cigar box she went.

One day a wild mouse had been caught in a trap and though still warm was dead. We attached a string to it and slowly drew it along towards Mr. Mouse. He boldly rapped his tail against the side of his box,—a challenge to an enemy. Still the grey mouse approached. The intruder seemed to be alive and coming to harm his mate and their brood of little ones. He pounced upon it and bit and worried it until, vanquished, it was taken away. Long after the dead mouse had gone the brave patriarch patrolled the top of his box, guarding against the enemy's return. To have known him in his usual character of peaceful, family mouse or to have seen him sitting upon some friendly, human hand, nibbling a tidbit and daintily washing his face afterwards, one would not have dreamed that such a valiant spirit dwelt in such a soft, white and unbelligerent little body. It is times of danger, however, that test the spirit of both mice and men.

SIMBA, KING OF BEASTS, REFLECTS
He just relaxes for the camera, and pretends to be a good-natured cat

THE CAMERA VISITS the ZOO

Stalking Many Animals in Their American Homes

by L. W. Brownell

Photographs by the Author

A LION roars. To the right of him, a tiger slinks nervously back under a tree, and crouches, while a towering giraffe, but fifty feet away, majestically spreads his legs and drinks, unaware of any danger. Farther up the slope a gray wolf paces back and forth, looking with yearning eyes at the great white-tail buck, his horns still in the velvet, who placidly munches tall grass in the shade of a maple tree. Down in the hollow, fish splash and birds gather—pink flamingoes from the Barbadoes, water ibis, snowy herons with great beaks and inflated dignities, pompous pelicans proud and conceited. And just up the stream from them an otter pops his head above water, and slowly, slowly swims towards the pond where trout are leaping. . . . The cougars crouch on tree limbs, the great grizzly swings his head from side to side, Tembo the elephant stamps and rumbles.

Into the midst of these creatures, the preyers and the preyed-upon, the camera man creeps. He, too, is hunting, and the shiny eye of his magic weapon glints in the sunlight, and sets monkeys chattering. Fearlessly he goes on—snap! a bull's-eye. Click! Another animal. Steady! Hold it. Ah, a perfect picture. Even Simba, the lion, succumbs. One can get a mighty bag—at the zoo.

There is no better place in the world for a beginner in Nature photography to take his first lessons than in one of the modern zoological parks. It is well to stalk game in the wild. But most of us who like to use our cameras for picturing wild life have not the time to go far from our homes—only our Sundays, Saturday afternoons and an occasional holiday are available. We cannot afford the tramp and the effort to seek out game in their native haunts—we cannot be sure of results and of even poor pictures, so uncertain are conditions. Much may be done, however, at odd moments in a zoo. Here, even a pocket kodak is a formidable weapon.

In the modern, well stocked zoological park the conditions of the natural habitat of the inmates are copied with as great fidelity as possible so that their lives are, except for confinement, practically what they would be in the wild state. They are so well cared for, moreover, that they are in most instances fairly perfect specimens of their kind. Their enclosures are so spacious, too, that it is very little trouble to eliminate completely from every picture all evidence of civilization and to give to each the appearance of having been taken in the wild. It is entirely possible for one to visit a zoological park with his camera and obtain as many pictures in a few hours as an expert might be able to obtain in the open country in as many days without a fraction of the trouble and exertion.

THE AMERICAN EGRET
She poses in nuptial dress, displaying the plumes that nearly caused her extermination

I am bound to admit, however, that the fun in a zoo will be considerably less, at least to him who loves the out-of-doors. But the pictures of the animals are apt to be

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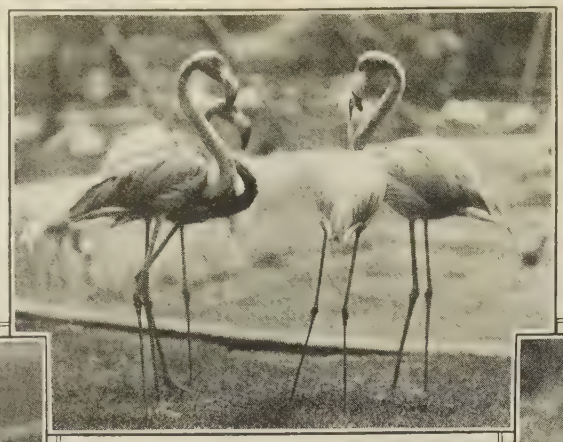


NOT QUITE AS CONCEITED AND LARGE AS HE LOOKS

The pelican puts up a big front in captivity as well as in the wild. Dignity is his motto; fish is his creed

THE WHITE IBIS, A WATER BIRD OF THE FAR SOUTH

Think of the trip to photograph him, if the zoo did not hold him always ready to be "shot" at in his enclosure

(Above) THE SOLEMN CONCLAVE TO SETTLE WEIGHTY PROBLEMS

Flamingoes love to be photographed. Remember, however, never to picture white or near-white birds in direct sunlight

very much better. One can approach much closer to a captive subject than to a wild one and can choose, to a large extent, his pose and lighting, while he who works in the great open spaces takes what he can get, at the time he can get it, regardless of everything except the fact that his subject is on the plate and in focus. A worker in the zoo should get, with care, twelve good negatives out of every twelve exposures while he who works in the wilds is lucky if he averages fifty per cent.

The beginner can learn many "thou shalt nots" and "shalls" in the zoo. The camera enthusiast whose time is limited will find it a haven. But above all, it is the place to which the expert Nature photographer must go if he wishes to obtain first class pictures of subjects that could not be obtained elsewhere. No really good worker in this branch of photography disdains the advantages offered him in such a place for securing best possible results with a minimum expenditure of nervous energy, patience, time and perfectly good plates.

To the average kodak user who has heretofore confined his camera activities to the usual amateur snap shots of his friends the zoo offers opportunities that can be obtained nowhere else. In it he can find an almost inexhaustible supply of material. As many times as he cares to visit it he can come away with his full quota of exposures that will make pictures worthy of album space. I can safely predict that he will find more pleasure in owning and using a camera than he ever knew existed before.

Fortunately most of the better zoological parks in this country are free to camera users. Unfortunately the best of them all, the New York Zoological Park, is not. The directors long ago decided that all but the one photographer stationed in the park must be excluded. It has always seemed rather a mistake that a place ostensibly created for the use of the public should not be open to it in all things. I am still hoping that, some day, they may come to the conclusion that their policy has been a mistaken one.

For photographing in the zoo the hand camera type is by far the most convenient. As I have said, the kodak may be used successfully but, in this case, it is an added advantage to make use of the portrait attachment to the lens in order to get larger images of the subjects. The tripod type of camera may be used, of course, but unless you are an extremely quick worker, your animal may have decided to take a trip by the time your camera is set up and you have prepared to make the exposure. Naturally a camera of the reflex type is the ideal one to use in this work, for with it we can photograph our subject at a distance or close up, make his image as large as the plate will stand or as small as we desire, watch him upon the ground glass until he strikes the right pose and make the exposure at just the opportune moment.

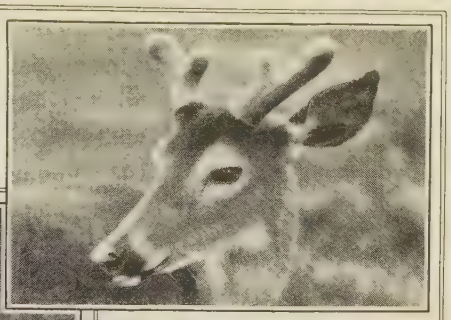
One must not gather from what I have said that photographing in the zoo is entirely easy sailing for there are difficulties to be overcome here as well as elsewhere. Strange as it may seem one of the greatest difficulties, or so I have found it, is that the animals are liable to be almost too friendly. By this I mean that they are apt to crowd so close to the side of the fence, expecting some tidbit, that they are too near the camera. If you move farther away the fence will show, and this is always bad. It always seems best to make the picture from a point of view that will eliminate all evidences of captivity. A wire fence showing in front of the subject not only gives full proof that he is caged but also makes ugly lines across his image which effectually spoil the picture. It is entirely possible to avoid this by putting the camera close to the fence, and pointing the lens between the strands of wire. Even if a wire should cross directly in front of the lens, if it is close enough, it will not show in the picture. Just wait a few minutes, however, if the creature is too near. He will

A TERROR OF THE WILD WHO NOW LIVES IN PEACE

Once his voice thrilled over Arctic trails, and sent animals and men to cover. Now he placidly eats and sleeps and will pose for you with a friendly air

(Below) FAR FROM THE NATIVE SHORE

Photograph such white-furred animals in the shade, for contrast



THE WHITE TAILED BUCK, A FAVORITE IN ALL THE ZOOS

His horns are still in the velvet. To picture him in the wild would be next to impossible, unless one had great good fortune and considerable diligence

decide to move further away as soon as he discovers that you do not intend to feed him.

Be careful that no fence, building, eating trough or other evidence of civilization shows in the background. I am not trying to advise that you make a picture of a captive animal with the idea of claiming, or making it claim for itself, that it was taken in the wilds. On the face of it this would be impossible, for anyone at all familiar with Nature pictures could not fail to notice the difference even under the best conditions. I do claim, however, that to make the surroundings of your animal look as natural as possible is no crime and something that all should attempt to achieve.

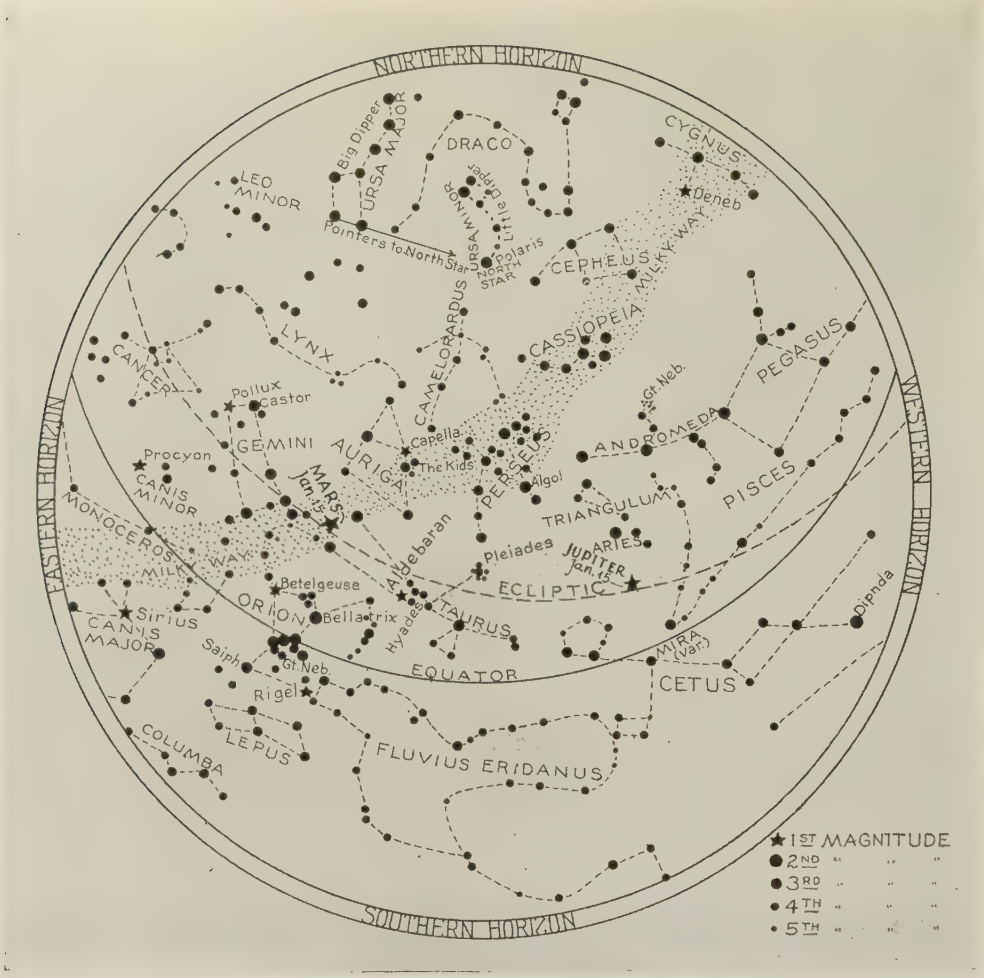
In many zoos the keepers will co-operate with the Nature photographer as far as to let him into the enclosures with the animals. When this can be arranged it is, of course, a very great advantage, for one can choose the proper angles from which to make the exposure, and consider the background, foreground and the direction of the light. It is impossible to pick and choose when working through a fence. When you first enter, you will find that the animals will crowd about here, too, but let them entirely alone and soon they will wander off about their own business. Then you can choose your subjects and make as many exposures as you please.

In the matter of lighting one must, of necessity, depend largely upon the exigencies of the case. I personally prefer never to make an exposure in the direct sunlight, except upon the darker colored animals, if I am using a lens that works at f4.5 or even f6.3. White-plumaged birds or white-furred animals should never be photographed in the direct rays of the sun unless it is utterly impossible to get them under any other conditions. Photograph them in the shade if possible, and at least take the photograph from some such point as will allow the sunlight to strike them from the side or even from the back, rather than from the front. In this manner much of the delicate half-tone and shadow which would be lost in the direct rays may be preserved.

I would like to impress upon my readers the importance of carefully selecting your subject before making your exposure and, after having selected it, of seeking the most advantageous point of view from which to make it. In a zoo one can be certain that his subjects will not wander far away and will be within reasonable working distance of him at all times. There is also a great abundance of material from which to make your selections, and plenty of time in which to do so, and you can well afford to be a little fussy over your choice. It is a great waste of both time and material to shoot recklessly at any and everything, as some are only too prone to do. Slower and more careful work will, in the end, produce just as many negatives and ones that will be certain to have a far greater quality both from a photographic and an artistic standpoint.

I have spent many days photographing in the zoos and I can truthfully say that I have never brought home any negative that I have been forced to discard, from any reason whatever, after development. Any one who has a good knowledge of the use of the reflex camera, which is the type I always use in this work, can do the same. All that is necessary is a little judgment and the ability to withstand the desire to make an exposure until all the conditions are correct to give the desired result.

Just try this quarry on a pleasant afternoon, when it is too late to get out afield. As you go clicking here and there, with the sound of your shutter drowned out by the noise of the birds and the grumbles of the animals, you will find pleasures you never thought existed before; but when you return in the evening, to bend over the developing bath and watch the images come clear and sharp, then you will know that Nature photography, in the future, will be your outdoor sport.



TO USE, HOLD OVER HEAD WITH TOP TOWARD THE NORTH

This map is designed for use on Jan. 1, 9 p. m.; Jan. 15, 8 p. m.; Jan. 31, 7 p. m.

The Celestial Sphere

Locating Stars Like Sailors Locate Their Ships

by Isabel M. Lewis

WHAT is the Celestial Sphere? It is not, as the uninitiated might suspect, the globe where are the Elysian Fields or the Valhalla of the Great. Nor has it any connection with crystal-gazing, although it is as imaginary, perhaps, as the creatures supposed to be seen by such a method. It is merely a convenient creation of the astronomer to help him locate the positions of the heavenly bodies much in the same way that a point is located on the surface of the earth by its longitude and latitude.

Space extends outward from the earth in all directions to a seemingly infinite distance. Throughout this space in various directions and at various distances we find the heavenly bodies. There are the sun, moon, planets, comets, asteroids and meteors in our own solar system and far beyond them the stars, the nebulas, the island universes and the Milky Way, which is our own island universe and in which the sun with its family of planets is but one small unit. The astronomer must have some way of defining the positions of all these various objects in the heavens with respect to the earth and each other, just as on our own earth there must be a way of defining the position of a ship at sea or an object on land.

When the longitude and latitude of a point on the surface of the earth is given we know exactly where to find it and in the same way when the right ascension and declination of a point in the heavens is given we know in what direction to point our telescopes to bring it into the field of view. The celestial sphere is an imaginary sphere of infinite radius with the earth at its center upon which the astronomer projects the positions of the heavenly bodies to aid him in locating them. The north pole of this celestial sphere lies directly

above the north pole of the earth. To an observer at the north pole it would lie directly in the zenith, or point overhead. The south pole of the celestial sphere is directly overhead at the south pole of the earth but unlike the celestial north pole it has no Polaris near by to mark its position because it lies in a region particularly barren of bright stars. The celestial equator lies midway between the poles of the celestial sphere just as the terrestrial equator lies midway between the terrestrial poles. It may also be defined as the great circle of the celestial sphere that lies directly above the earth's equator. If a star lies on the celestial equator it will pass directly through the zenith when it crosses the meridian at all places on the earth's equator. In addition to the celestial equator we have on the celestial sphere the great circle known as the ecliptic, which intersects the celestial equator in two points known as the equinoxes. The vernal equinox is the point where the sun crosses the celestial equator going northward in the spring and the autumnal equinox is the point where it crosses the celestial equator again six months later going south at the beginning of autumn. The vernal equinox is a very important point of reference in the heavens as we will see later. The ecliptic is the *apparent* path of the sun among the stars in a year or the *true* path of the earth around the sun in the same period of time. On our star maps we will see the positions of these two important great circles of the celestial sphere shown or rather the portions of them that are visible at any one time.

Now our celestial sphere, we will find, has great circles passing through its north and south poles analagous to our meridians on the earth. These are known as hour circles. The hour circle that passes through the north and south pole of the celestial sphere and also through the vernal equinox is the prime meridian of reference on the celestial sphere, just as the meridian of Greenwich is the standard meridian on the terrestrial sphere. The longitude of a point on the earth's surface is its distance east or west of the meridian of Greenwich measured in degrees, minutes and seconds of arc, or hours, minutes and seconds of time. The right ascension of a celestial object, as sun, moon or star, on the celestial sphere is its distance east of the celestial meridian of reference, or hour circle passing through the vernal equinox, and is measured in hours, minutes and seconds of time or degrees, minutes and seconds of arc always eastward through the entire 360 degrees of the circumference of the celestial equator or its equivalent of 24 hours of time. It is measured along the celestial equator to the foot of the hour circle which passes through the star. It will be seen from this definition that the right ascension of a star is analagous to the longitude of a point on the earth's surface. The declination of a star is analagous to the latitude of a point on the earth's surface and it is the distance of the star north or south of the celestial equator, measured in degrees, minutes and seconds of arc along the hour circle passing through the star and the north and south pole of the celestial sphere. If the declination of a star is –40 degrees, for example, it lies 40 degrees *south* of the celestial equator. It will pass through the zenith of a point in latitude 40° South, when it crosses the meridian. The declination of a point on the celestial equator is zero degrees and the declination of the north pole of the celestial sphere is 90 degrees and of the south pole –90 degrees.

When the right ascension and declination of an object in the heavens are given, its position is just as accurately defined in the heavens as a ship at sea is defined when its latitude and longitude are given. Often we read of the discovery of a new comet or asteroid. The discoverer telegraphs its position to the central astronomical bureau which in turn sends to all interested the right ascension and declination of this object. In this way other astronomers are able to locate and observe it.

With the aid of a good star atlas any amateur astronomer can soon familiarize himself with the positions of some of the most important objects on the celestial sphere. His horizon plane, he will find, cuts the celestial sphere in a great circle, the position of which changes with the latitude. If the observer is at the north or south pole of the earth his horizon coincides with the celestial equator and if he is at the earth's equator the north and south poles of the celestial sphere coincide with the north and south points of his horizon, respectively. At the equator the Pole Star is in the horizon and at the north pole it is in the zenith, or point directly overhead. What stars are visible in any latitude depends upon the position of the horizon with respect to the celestial sphere.

The star-gazer will soon find that there are certain stars that never set in his latitude. These are the stars that lie within a distance of the north pole that is equal to his latitude. For example, if his latitude is 40°, stars within forty degrees of the north pole of the heavens will never pass below his horizon. These will be stars whose declinations are greater than 90° minus his latitude. All the stars in the Big Dipper have declinations greater than fifty degrees (90°–40°). So in latitude 40° North the Big Dipper never passes below the horizon. Also stars within forty degrees of the south pole of the celestial sphere will never rise north of 40° North Latitude. These will be the stars that have declinations greater than –50°, or, in general, greater than the latitude minus ninety degrees. The declination of Canopus, the second brightest star in the sky, is –53° approximately, so it is below the horizon north of 37° North Latitude. Alpha Centauri with a declination of –60½° cannot be seen north of 29½° North Latitude.

On our star map for January we will find indicated the positions of the celestial equator and the ecliptic for all places in 40° North Latitude. Their positions with respect to the horizon as well as the stars visible will change very little for a change in latitude of five or even ten degrees north or south. The altitude at which the celestial equator crosses the meridian is always equal to 90 minus the latitude; so in latitude 40° North the equator crosses the meridian at an altitude of 50 degrees above the south point of the horizon and a star in declination 50° south will be exactly at the south point of the horizon in this latitude when it crosses the meridian.

To study the stars understandingly one should have some knowledge of these fundamental facts about the celestial sphere and the position of the observer's horizon with respect to it, as well as the positions of the

celestial equator and ecliptic and the way in which the stars are located on the celestial sphere by means of their right ascensions and declinations. The right ascensions and declinations of the stars vary very little from year to year and their relative positions remain nearly the same over long periods of time, but the sun, moon and planets and other members of the solar system change more or less rapidly in position with respect to the stars and their right ascensions and declinations change in some cases very greatly in a few days. The moon and Mercury change their positions the most rapidly, and the outer planets, Uranus and Neptune, change very little in position from day to day.

There are three planets in view now in the evening sky,—Venus, Mars and Jupiter. In addition, Mercury may be seen for a few days near the time of its greatest eastern elongation on January 22 when it may be found low in the southwest immediately after sunset. Venus is now a fine evening star in the western sky, setting about three hours after the sun. It is by far the brightest stellar object above the horizon. Its nearest rival in brightness is Jupiter which will now be found in the western sky in Aries. This is a fine time to look at the giant planet in the telescope. His satellites and ever changing surface marking are always a source of interest.

Unlike Mars, which may be seen to advantage only for a few months every other year, Jupiter always may be counted upon to show up to advantage in the telescope and for this reason it is a far more satisfactory planet to observe.

Mars is now at its best, or nearly so, for it passed opposition late last month and, next to Venus, Jupiter and Sirius, is the brightest stellar object in view. It will be found high in the eastern sky in Taurus, a little to the east of the horns of The Bull. It can be distinguished from all other planets and stars at this time by its brilliant reddish color. At the beginning of January it is nearly as bright as Sirius but it will decrease rapidly in brightness during the month, for its distance from the earth is now increasing. This is not one of the more favorable oppositions of Mars but the planet is now very favorably located for observation in the northern hemisphere as it is very nearly at its greatest possible distance north of the equator. On January 1 its distance from the earth is about fifty-seven million miles and by the end of the month this will be increased to about seventy-four million miles. The planet Saturn is now in the eastern sky in the early morning and may be seen low in the southeast just before sunrise.

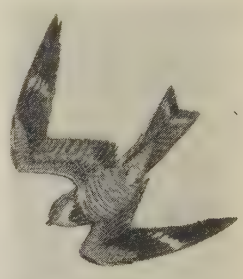
Among the constellations, the magnificent Orion, in the southeast, Gemini to the northeast and Auriga to the north of Orion call for special notice, as well as Taurus, now on the meridian. Directly north of Taurus is Perseus in the path of the Milky Way and to the northwest of Perseus, Cassiopeia and Cepheus. Andromeda and Pegasus fill most of the western sky between Perseus and the western horizon.

Among the interesting astronomical events of the coming year is the total eclipse of the sun on May 9 which will be total in Sumatra, the Malay Peninsula, Cochin China and the Philippines. This will be a fine eclipse of more than five minutes' duration.

THE MYSTERY

A Nighthawk Furnishes Thrills With His Trick

by Edith M. Patch



"BOOM!" There it was again, a sound unlike anything we had ever heard. Half-way between a groan and a grunt, we decided—queer, ethereal. And had we not been a large-sized party, we might have, well, talked of banshees and Irish fairies and ogres. Guides protested that neither bears nor porcupines were guilty of such a sound. "Boom!" It was repeated many times and came from different directions with incredible rapidity. On cloudy days the noise might come at any time; when the sky was clear, however, sunset was the favorite hour—salutes to the evening.

But a guest came into camp, a guest who knew the Maine woods. He led us to a clearing where we saw a nighthawk performing his circus trick. Down through the air at breakneck speed he would fall—then stop just in time to escape dashing himself against the ground, turn, and fly up again. At the moment of his turn, the strange sound was made by the rush of air through the wing feathers—"Boom!"

We went back to camp in shame. Often had we visited the nesting birds on the flat roofs of city houses, and seen the circus drop. The city traffic had deadened the weird sound to nothingness at home; yet in the Maine woods, the bird had startled us and caused us to wonder.

Helping California Fish

The screening of streams and ditches to prevent fish from being diverted to irrigated lands, and the supplying of fish ladders at falls to help during the up-stream spawning rush have been two of the recent steps taken by the California State Division of Fish and Game to save fish life in the state, John Spencer, director of the bureau of hydraulics of the division, reports. The Division has been active, in addition to helping fish in this manner, in preventing oil pollution of California waters, and recently won a signal victory in California courts.

Fringed Gentians

"Save fringed gentians by digging them up" is the slogan created by C. W. Johnson of Springfield, Mass., photographer, conservationist and Nature lover, to save this prey of automobilists from extermination. He advises transplanting roots and all to the home grounds; the seeds ripen there, and can be protected so as to plant acres. Mr. Johnson has had particular success in growing these delicate annuals. Earth baked to kill fungous growths is used for setting the seeds, and with reasonable care most of them can be brought through the precarious childhood. Once the second season has started, they spring up rapidly, and furnish beautiful blooms. Mr. Johnson hopes to create a love for growing gentians rather than a predilection for picking them.

Much-Visited New York

More than three million tourists passed through New York's state parks in the Niagara Reservation and the Alleghany region during last season, the office of the Conservation Department reveals. Over two million and a half, some of whom were not honeymooners, passed over the bridges to Goat's Island. The newly opened Devil's Island state park proved most popular, and it is expected that the 54 acres of Whirlpool Park will likewise draw large numbers of tourists when it is opened next spring.

Avaricious Kingbirds

It has long been known that kingbirds hang around apiaries like flies near a molasses barrel. The bee-keeper, too, finds numbers of bees missing. The argument has waxed hot and heavy, however, as to whether the birds eat only drones, or only workers, or both. Arthur A. Beale of Point Loma, California, has decided for his own satisfaction, however, that they are indiscriminate, with perhaps a leaning toward workers. He opened the gizzards of four of these robbers and found in each only workers. One held five of them. How the birds swallow the "hot tails" of these creatures without contracting laryngitis or worse is a mystery; he is sure, however, that they do not decrease just the idle members of the hive. The harm that the birds do, however, is offset by their destruction of many enemies of the bee.

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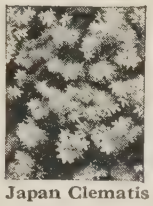
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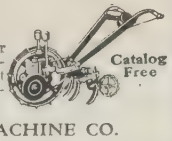

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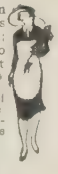

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NATURE NEWS AND VIEWS

Hundred Pounds Reward

The white rhinoceros is one of the rarest of Africa's store of animals, and when not so long ago two of them were shot all South Africa from the Cape to Rhodesia reverberated with angry protests. Dr. William T. Hornaday, an American, offered one hundred pounds reward for information leading to the arrest and conviction of the depredators, and a citizen of South Africa, Major F. Vaughan-Kirby, using the columns of Nature Magazine in thanking him for this generous act, writes:

"Once again America has come forward and done what South Africa ought to have done, and has shown that she easily leads all other nations in the noble effort to conserve the wild creatures throughout the world. I am in a position to state that Dr. Hornaday's generous and timely offer has created a very deep impression throughout South Africa, and particularly so in Natal, and I am quite certain that there are very many keen protectionists in this country who join me in the expression of gratitude to Dr. Hornaday for what he has done. And as he is an American citizen, it follows that, through him, we thank the American people"!

Dr. Hornaday's action, bringing such praise as it does, is truly commendable, and Nature Magazine wishes to join its thanks to those of Major Vaughan-Kirby. He has fostered conservation not only in South Africa, but also in America, where there are no white rhinoceroses, it is true, but plenty of other rare creatures daily slaughtered.

The Big Fight

Massachusetts has been the home of many a battle from 1620 on, but the struggle that is going on there between the legal talent of the billboard companies and the Massachusetts Billboard Law Defense Committee on the question of the constitutionality of the Massachusetts billboard law authorizing towns and cities to regulate billboards on private property by local ordinance is as intense as any the Bay State has known. The proponents of the law say that if it is held unconstitutional by the Supreme Court of the nation, all past attempts to enforce outdoor good manners on advertisers will have been rendered void, and those wishing to keep the highways beautiful will have to start at the beginning again. An appeal for funds has been made by E. T. Hartman, State Street Trust Company, Boston, Mass., to furnish the necessary fuel to keep the legal lights burning and the decision from going by default.

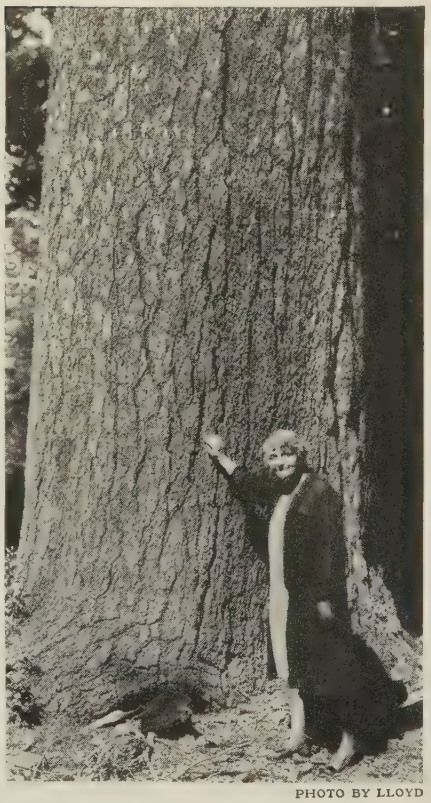

PHOTO BY LLOYD

Studies Yosemite

In connection with her work as Chairman on Forestry and Natural Scenery, Highways and Memorial Tree Planting for the General Federation of Women's Clubs, Mrs. Charles Cyrus Marshall of New York recently made a personal survey of the situation in Yosemite National Park. Accompanied by Mr. Marshall, she obtained first hand information relative to the character of the timber to be found on the privately owned lands within the Park area, lands which have been threatened with logging to the serious injury of the beauty of the Park. In the picture above Mrs Marshall is shown standing by one of the immense and beautiful sugar pines growing within the borders of the Park but on land that is in private hands.

Forest Trails

Utilizing the ten per cent of the total revenue from national forests granted them for road building purposes by Congress, the Forest Service is looking forward to spending half a million dollars to supplement the 14,000 miles of roads and the 40,000 miles of trails already in existence.

Conservation Organization

With its first aim that of securing the passage of the Norbeck Migratory Bird Refuge Bill and amendments to make it workable and effective, the National Committee on Wild Life Legislation, composed of leaders representing a number of conservation organizations, recently met and laid plans for a coordinated nation-wide movement to secure the preservation of wild life resources in the United States. This committee is planned to serve as a means for gaining close cooperation from all conservation groups, and for presenting in the future the united front which hitherto has been sadly lacking. The personnel of the committee consists of Dr. T. Gilbert Pearson, President of the National Association of Audubon Societies, New York City, Chairman; Carlos Avery, President of the American Game Protective Association, New York City, Vice Chairman; Seth E. Gordon, Conservation Director of the Izaak Walton League of America, Chicago, Secretary; Dr. John C. Phillips, President of the American Wild Fowlers, Wenham, Massachusetts, Treasurer; and Messrs. George D. Pratt, President of the American Forestry Association, New York City; E. Lee LeCompte, State Game Warden of Maryland, representing the International Association of Game, Fish and Conservation Commissioners; R. G. Parvin, State Game and Fish Commissioner of Colorado, representing the Western Association of Fish and Game Commissioners; I. Zellerbach, President of the California Game and Fish Commission; I. T Quinn, State Game and Fish Commissioner of Alabama; Keith McCanse, State Game and Fish Commissioner of Missouri; and Gustavus Pope of Detroit.

Tule Lake

One of the most important of the eighty wild-life reservations in the United States was created recently by executive order of President Coolidge, when the 10,000 acre Tule Lake sanctuary in northern California came into being. It is the natural refuge for mallards, redheads, ruddy ducks, cinnamon teals, and avocets, stilts and other shore birds, and will supplement the Clear Lake refuge in California and the Upper Klamath reservation. A year ago, abandonment of the Lower Klamath Lake project because of lack of water was predicted to bring dire consequences, but the setting aside of this sanctuary will partly make up for the loss.

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Helps and Hints
FOR HOME AND GARDEN

It is indeed fortunate that the day for making good resolutions so closely precedes the period of garden planning. Otherwise many of the projects promised on New Year's Day might never get any farther than the idea stage. Since January is the month for planning in detail, however, you may be more sure that your enthusiasm will keep alive.

* * *

Seeds and shrub catalogues replace hoes and rakes this month; garden magazines and books usurp the attention given to blooms and borders, while you sit near the fire and dream of the coming season. A map of the land available for gardening, with trees and rocks marked in, will help you visualize the possible effects, and enable you to scientifically take advantage of every inch of space. An inch to ten feet will serve as suitable scale.

* * *

Why not promise yourself more native evergreens for your garden? Among the more picturesque varieties are alpine firs, redwoods, Douglas firs, the Colorado blue spruce, the incense cedar and members of the *arborvitae* group. While fall planting of evergreens has the sanction of tradition, yet the spring serves as a suitable period for this.

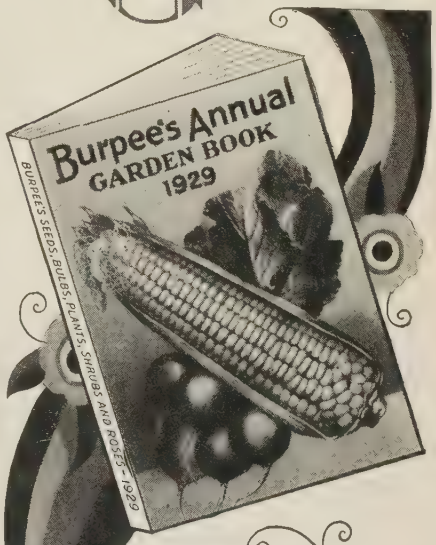
* * *

Orders for seeds may go in this month, to get ahead of the usual Spring rush. If you have a supply on hand, a test at this time will help you plan your needs more accurately. The testing equipment consists of two pie plates and two pieces of blotting paper. Mark one of the blotters into sections, soak it well, and onto each section place about fifty of one kind of seed. Then the blotting paper may be fitted to the pie plate, and the other blotter, soaked likewise, placed on top of the seeds. The second pie plate serves as a cover for a very good looking sandwich. Set the apparatus in the house under conditions of temperature and humidity similar to those usual at the time of indoor planting. Each day the top blotting paper should be thoroughly dampened with a fine spray. After a week, count the number of seeds of each kind which have germinated, and after ten days, take the test down. Unless at least fifty percent show signs of life, the packets are of poor quality, and should be thrown away. Of course, this test will not apply to some of the slow-germinating varieties, or those that characteristically show small percentages of viable seed, but it is useful for most of the annuals.

* * *

While on the subject of planning, we refer you again to the list of books which appeared in Hints and Helps for December. These will give many helpful suggestions for making a beautiful garden.

Burpee's Seeds Grow



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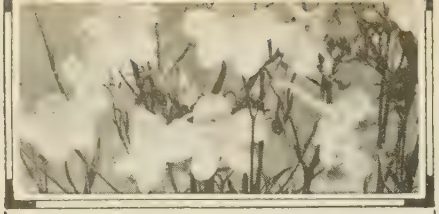

Harris' New Butterfly

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For Bouquet and Border

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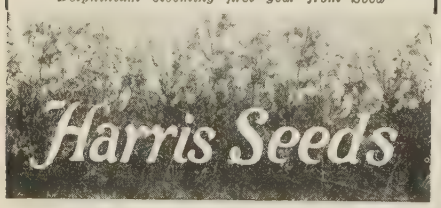
Delphinium blooming first year from Seed



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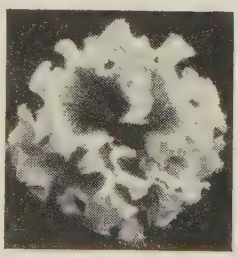

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Catalog of Exceptional Gladiolus, Petunias, Dahlias, Delphinium, Tomatoes, etc., free on request.

RICHARD DIENER

Oxnard, California, U. S. A.

dening for the month cannot be done inside. In order to hold your own with the garden, you must constantly go ahead. See that the trellises are in good order and the fences repaired. Watch closely, too, to make sure that the Winter storms do not displace the mulch from around your plants. Shrubs and delicate plants had best be covered, especially in the snow-swept regions of the country, lest the dazzling rays of the sun reflected from the snow burn them. As destructive as the sun, too, are the ice-storms and wet heavy snowfalls. After each of these, inspect your conifers and evergreens, to see that they have suffered no ill effects. If branches are broken, cut them off, to prevent greater damage, and daub the stubs with some good lead paint.

* * *

Now is the time to get into fur-lined gloves, muffler and heavy shoes, and go forth to prune. Only the hardwood deciduous trees and the summer-flowering shrubs should feel the knife now, however; the evergreen trees and shrubs are dormant during this period, and must not be touched. Currants and gooseberries may be cut back sparingly, for they bear to the greatest extent on wood that is several years old. Grapes and such vines need attention, too, —cut the new side shoots back to three buds for flowers and fruits, which appear on the new wood. Do not delay in this task, for the sap starts to flow early in such plants.

* * *

If you have any changes to make in the location of large, hardy plants, it is easy now to freeze a ball of earth around their roots, and sled them over the frozen ground. This can be done more easily during the winter than at any other time.

* * *

Do not forget to look over your frames and hot-house equipment to make sure everything is shipshape. Nothing can discourage the gardener so completely as to discover, just when he is ready to plant, that he must turn carpenter for several days. Inattention to such details is rather incriminating, too. Nor can you afford to become so deeply immersed in planning by the fireside as to forget to keep your tools polished and free from rust.

* * *

Gladioli corms and dahlia tubers should be looked at occasionally to see that they have not begun to rot or wither. If any of the dahlia tubers have started to decay, cut off all the decayed parts, and apply powdered sulphur or air-slaked lime to the parts that have been cut. Be sure that there is plenty of air circulation, and do not let them become too damp.

* * *

The real gardener will not be content to do without blooms this month, even though he is engaged with preparations. He must have signs of growing life around him. It is now that the winter indoor blossoms will mean the most. Hyacinths, daffodils, narcissi, tulips, crocuses, lilies-of-the-valley—these are but a few of the flowers that can grace your home during this period of snow and cold.

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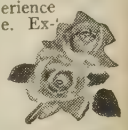

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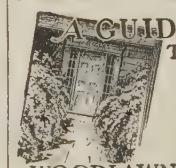

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There are three ways of securing these winter blooms all of which are still open to the gardener who has delayed in making certain that he would not be left without flowers during the winter months. The simplest method is forcing bulbs in fiber or pebbles or water, and serves for Chinese lily, paper-white narcissi, hyacinths and crocuses, among others. Many summer flowering bulbs can be handled in this way. The more successful method, however, for the majority of tender and autumn-flowering bulbs and some of the half-hardy ones, is to grow them in pots where enough substantial nourishment is given to cause normal growth. In the first way, the flower develops on food stored within the bulb itself, and the bulb gradually wears itself out. When the plants have the opportunity to grow and feed, however, the bulbs last from year to year, with occasional repotting.

* * *

Cold storage lily-of-the-valley pips may be forced within about three weeks. Use sand or fibre for potting, and keep them in the dark from ten days to two weeks, until the foliage is two or three inches high, then remove to full light. Keep them cool, however, and give them plenty of ventilation when the flowers open; they will last for three or four weeks in a beautiful array that all will admire.

A Bird Bulletin

A new interesting little monthly publication wings eastward from the California Audubon Society to spread bird lore through the nation. It is just-born *Phainopepla*, edited by Mrs. Harriet Williams Myers, which contains news of activities in the world of bird-lovers, a monthly short story about one particular bird, bird-book reviews and a bird-calendar, all on four pages. Its purpose, as an editorial in it points out, is "to keep before the bird lovers of the West items of interest concerning the bird life both of State and Nation". Subscriptions are fifty cents a year. The editor promises to enlarge the bulletin if the demand is forthcoming, and that will undoubtedly happen soon.

Bombarding Atoms

Using apparatus which develops an electrical pressure of more than 5,200,000 volts, the highest ever obtained, scientists at the Carnegie Institution of Washington, D. C., hope to dig deeper into the essence of matter, further shatter the atom, and create X-rays which will penetrate to a depth of feet rather than inches, according to Dr. Tuve of the Department of Terrestrial Magnetism. The terrific speed generated by the electric current at this voltage approaches that of light, and will break up the atom much as Rutherford of England broke it up with radium rays. Scientists now are working on vacuum tubes which can stand the unusual strains generated by the electricity, and once these are perfected, it is predicted that much new information will be obtained on fundamental nature of matter.

Season's Greetings

JUST as the humble Christmas Fern above seemingly pauses in silent thanksgiving, so do we express grateful appreciation to our many friends and customers for their loyal support during the past year.

Prior to coming into its own, naturalistic gardening was little practiced and understood. But the pioneer work done by the founder of this firm finally bore fruit. We now are recognized as the country's leading nursery specializing in materials for naturalistic plantings.

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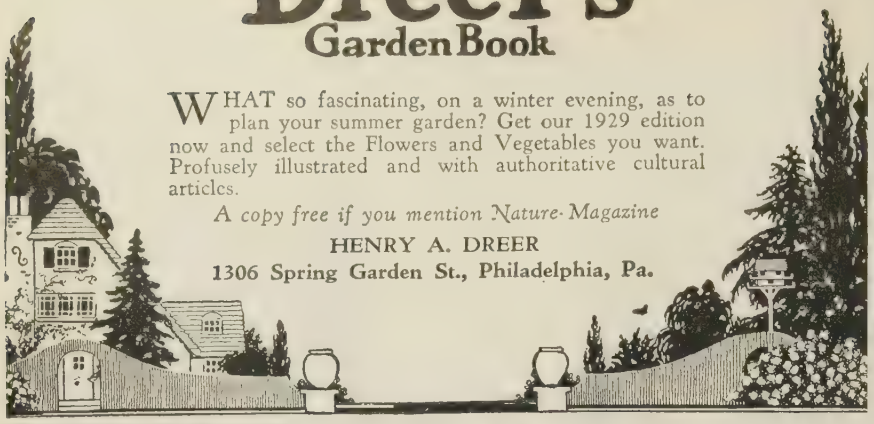

WHAT so fascinating, on a winter evening, as to plan your summer garden? Get our 1929 edition now and select the Flowers and Vegetables you want. Profusely illustrated and with authoritative cultural articles.

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A Fish Doctor

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What's in a Kit?

What are the articles that should make up an ideal, compact, easily carried outdoor kit? The Wollensak Optical Company of Rochester, N. Y., in order to find out, made a survey among outdoor men with large experience, and four instruments were selected from the poll. The compass was a unanimous choice, and a good knife with can and bottle opener, reamer, screw driver, punch and belt-clip was next favored. A telescope and a pocket-magnifier completed the handy quartet. So if you are guided by others' experiences, make sure these accompany you on your future jaunts.

Philanthrophy

A gift of $20,000 which will enable students of exceptional ability and promise to attend Yale Forestry School under scholarships and fellowships has been made to the New England institution by Mrs. William H. Sage of Albany, New York, widow of the late William H. Sage, who donated the money for Sage Hall, one of the newer buildings of the school. The fund is a memorial to her husband, and according to Henry S. Graves, dean of the Forestry School, it will help considerably in fostering the cause of forestry in the United States.

Sensible Nature Study

The fact that Nature study must follow the lines of moderation laid down for other studies was driven home recently by an incident happening in New York, where a competition in flower bulb buying among schools brought sorrow into at least one life. Each teacher had instructed pupils to bring money to buy bulbs, so that her school might make a "good showing", and one boy, on discovering that his mother could give him no more money for this purpose, refused to go to school, ashamed that he could not do what he felt was his "part". Such competitions have nothing to do with Nature, and whether each school has but one bulb or a hundred is not so important as what the flowers mean to the individual pupil. In one case, 4000 students were levied for 25,000 bulbs, and this in a district where money does not come easily. Nature study must keep from going off on such irrelevant tangents as this.

Animal Trails in the Snow

The time is now approaching when the majority of camera owners are apt to pack away their outfit and never touch it again until the snows are gone and the air again warm and balmy. I could never quite understand this, unless it is a desire to remain in the house out of the cold, for, while the subjects to be found for our cameras are not quite so numerous in the winter as in the summer, still there are many and most of them are such as cannot be found at any other time of the year.

Chief among these are animal tracks in the snow. Have any of my readers ever gone tracking? If not they have missed a most interesting sport and one that can teach them much about the animals. Also, it is well when engaged in this sport, to have a camera along in order to make a lasting record of what we find.

The photographing of animal tracks is not difficult but there are some little tips that may help the beginner at this particular branch of Nature photography. In the first place we must remember that the snow, being white, and the shadows on it being bluish, which photographs as white, in order to give the maximum of contrast between the tracks and the surrounding snow we must use orthochromatic plates with a color screen. Also, in order to make the shadows in the tracks as pronounced as possible we must not photograph them from a point with the sun at our back for from that viewpoint very little, if any, shadow can be seen in the track holes. The best position for the camera is pointing a little to one side of directly toward the sun. Should this cause a reflection on our ground glass from the rays of the sun then we must so shade the lens as to eliminate it.

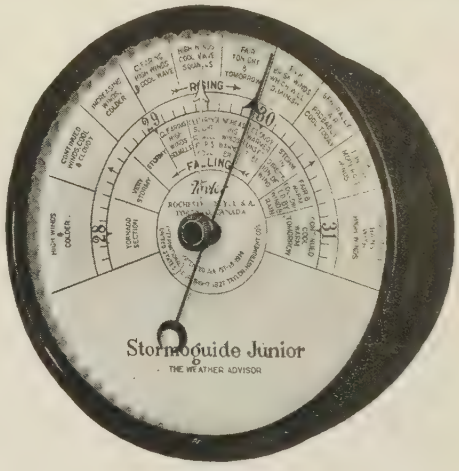
Of course a tripod camera must be used in this work as it is necessary to use the very smallest stop on your lens in order to get the tracks in sharp focus as far as they can be seen. This does not, necessarily, mean that a kodak, or even a graflex, cannot be used, for either one, with the aid of the ground glass back, can be used upon a tripod.

Focussing should not be done on the track nearest the camera in the image but upon one that is at least two or three feet in front of that one. Then, when the lens is stopped down to the smallest aperture, it will be found that the tracks are in sharp focus from the one nearest the camera to the one at the limit of the field of vision of the lens. The camera should be set not more than two feet above the surface of the snow in order that as many of the tracks as possible shall be included in the field of vision and it is also well, when possible, to have the sky-line in the image as it makes a more effective picture.

Of course it is not necessary to advise that only the best examples, in the clearest snow, be chosen as subjects. Also it is a good plan not to trample the snow about the tracks before making the exposure.

Taylor Stormoguide

does not control the weather but forecasts the kind of weather to prevail 12 to 24 hours hence and does so with high average accuracy; enables you to plan your work, or your pleasures, to organize every phase of your everyday life so you can take advantage of all kinds of weather, good or bad.



When you know the weather will be fine, you can arrange your outdoor activities; when you know it will be cold, rainy, or disagreeable, you can plan accordingly.

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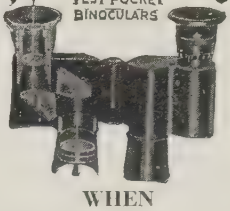

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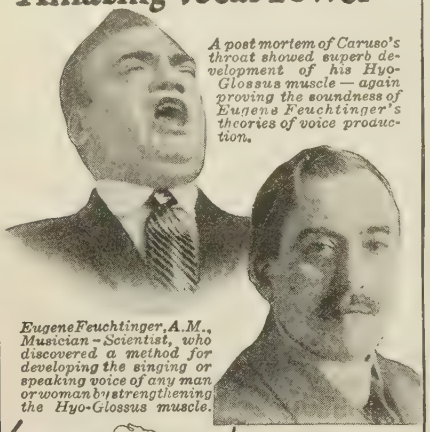

A post mortem of Caruso's throat showed superb development of his Hyo-Glossus muscle — again proving the soundness of Eugene Feuchtinger's theories of voice production.

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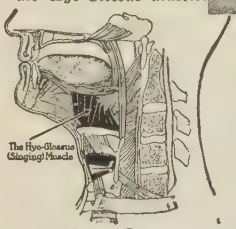

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Heath Hen Biography

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These are some of the high points brought out in a beautifully illustrated and altogether admirable monograph by Dr. Alfred O. Gross, published as a Memoir (vol. 6, no. 4) by the Boston Society of Natural History, May, 1928. Besides the facts relative to its distribution, general habits, food, and the adverse factors with which this interesting bird has had to contend, a good description of the various plumages is presented, and notes on its muscular, skeletal and visceral anatomy. A nearly complete bibliography closes this excellent account, a report which bears to a marked degree that melancholy interest that always attaches to the chronicle of an interesting species that seems to be making its last tottering stand.

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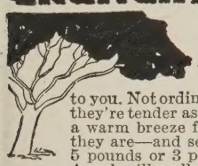

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Henri Fabre's Biography

Men lead the movements of the world, and through their biographies, masses may find the path they wish to tread. Years after college, it is the personalities of your professors you remember, not the dry-as-dust facts the textbooks carried. And for the Nature lover, the story of Henri Fabre, as told by Mary Hazelton Wade in *The Boy Who Found Out,* will be a greater inspiration than many biology books. The author has caught a touch of the soul of this great French naturalist, who was brought up in humble surroundings, taught himself, and forced himself to the top by patience, joy in his work, and careful experimentation. She has drawn a life-size picture. After reading it, you, too, will find yourself more closely attuned to Nature, and more eager to see if it may not be your lot to find the happiness and beauty in the world of little things that Fabre found. Appleton and Company, New York, publishes the book at $1.75.

Florida Trees

To help out the average visitor to Florida, who knows little or nothing about the semi-tropical tree growth there, Nellie Irene Stevenson has recently brought out a guide to twenty *Tropical Trees in Florida* as a supplement to an earlier booklet on seventy-five trees, shrubs and other plants of the northern part of the state. The latest booklet is meaty and clearly written, with descriptions having pictorial qualities. Copies may be obtained at fifty cents each from the author in Fayette, Indiana.

Cape Cod Life

Joseph Lincoln revealed the soul of Cape-Codders, but it remained for Henry Beston to express in glowing, colorful terms the romance of the natural life along the curving strip of sand-dune, marsh and clay from Provincetown to Eastham. *Outermost House* was written to the tune of pounding breakers sloshing ice-spray on the author's house on a Cape-Cod beach; it is a novel where the seasons are the *dei ex machina,* and the characters the waterfowl, the birds, the butterflies, the occasional larger mammals and now and then a human visitor to the beautiful and desolate place. Mr. Beston has created the wilderness again for those who cannot always live in New England. His book is published by Doubleday-Doran of New York at $3.00.

High School Zoology

The High Schools of our friends across the Northern border now have another aid in teaching zoology in the form of a book on the subject written by J. F. Calvert, M. A. and J. H. Cameron, of the South Collegiate and the Central Collegiate Institutes, respectively. Excellent pictures, very readable and interesting text, and complete treatment mark the work. Chief of its assets, and rather original, is the chapter on protection of wild life, which has a decided conservation value and lists the places in the provinces where animals are given sanctuary. The Educational Book Company of Toronto, Publishers.

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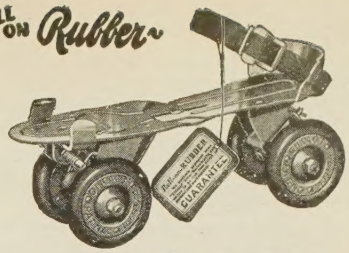

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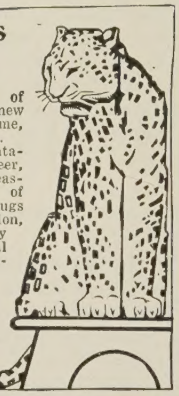

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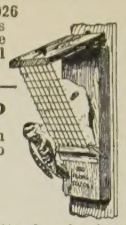

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The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

The Association directs encouragement of tree planting by the public; disseminates popular forestry news for the information of editors of the daily press; and compiles and distributes forestry news and reports on legislative progress for assistance of active foresters in the field.

The American Tree Association

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RUSSELL T. EDWARDS
Educational Director

With a New Year before them, members of the American Tree Association can review the old one with satisfaction. The educational work of the Association has resulted in two million six hundred thousand Forestry Primers being put in the schools of the United States. This means that more than eight carloads of paper have gone thus far into the printing of the Forestry Primer. The free distribution reached this great total just as the year ended, due to the fine co-operation of the school teachers of the land. They are using the Forestry Primer in many ways, thus placing in the mind of the coming generation the importance of putting idle land to work growing trees. The teachers are enthusiastic about the Forestry Primer.

That the student spreads the message is shown in a letter from Katherine H. Altes of the Cochran School of Louisville, who tells the Association that: "I have before me a copy of the Forestry Primer and find it of such excellent quality that I should like to use it in a big project I am planning on Forestry. After many weeks of study we intend to sum up the work with a program to bring before the parents' minds the importance of forest conservation."

Here is a program that other teachers may see fit to copy. There is a fine extension of the Association's work if the mind of the parent can be reached, because the parent is very receptive to anything the pupil has to say about what is going on in his school. The demand for the Forestry Primer became so great that, in the case of some states, special editions were printed with a lesson devoted to the state into which the Primer was sent. Such lessons drive home the subject of forestry.

At the start of a New Year it is well to remember that three hundred years ago our forefathers were concerned about the very thing the American Tree Association is working for today,—the assurance of a steady flow of forest products as a basis of continued national prosperity. In 1626 the Plymouth Colony recited the hardships of a shortage of timber and passed a law forbidding any man to saw timber outside the colony unless he had the approval of the Governor and the Council. William Penn knew the value of forest, too, because in 1781 he set down the regulation in his colony that one acre should be left in forest land for every five cleared for agriculture. Now we are faced with a population many times greater than in that day. So it is that to turn public thought to the importance of a tree crop every year, just as we have other crops, is an object of the American Tree Association. The public must understand.

A timber crop every year much closer to the section of greatest consumption—the manufacturing centers—is another term for a national forest policy, for that timber crop is what a national forest policy would create. It is in this great work the educators of the land have enlisted with such good will and it is to them the American Tree Association at the start of a New Year extends the heartiest thanks for their fine co-operation.

But for those whose school days have passed, other ways of interesting them in the message of the trees must be found. This is the tree planting army. To become interested in one tree means you will surely become interested in any question having to do with trees. Thus we become "forestry minded." To join this tree planting army you must plant a tree and register it on the national honor roll of the American Tree Association. Just as the Forestry Primer will be sent any one who sends a stamp for postage so tree planting suggestions and an application blank for membership will be sent. Why not make your plans now? Arbor Days are not far away. Let us picture what our millions of acres of idle land will look like in 1972, the centennial of Arbor Day, if those acres are planted to trees now. What will a single tree you plant this Spring look like? It is an engaging picture just to look ahead almost fifty years. In tree planting we must have vision. Scouts, Camp Fire Girls, Women's Clubs have the vision and are planting thousands of trees each year The message of the trees has been caught up by business organizations in many places and idle land is being put to work. In some places this planting takes the shape of town forests. Cost of planting such a town forest can be ascertained by consulting your state forester and there is a great opportunity in such a plan for making such a forest a recreation center. Is there not in your town, at the start of this New Year, the group with a vision that sees this phase of tree planting?

The time is short for making plans. In Arizona Arbor Day comes on Friday after February 1, except in the five northern counties where it is Friday following April 1. Arbor Day is the first Saturday in March in Arkansas, while California plants on March 7, Luther Burbank's birthday. In Florida the first Friday in February is the day. Louisiana takes the second Friday in January. In New Mexico the second Friday in March is the date. In western Oregon the date is the second Friday in February. Washington's birthday is the Texas date. By planning to plant a tree you not only do a worthy deed but you set a fine example to others. So join the tree planting army.

Reforestation in Michigan
(From the Toledo Times)

The federal government planted 345,000 Norway pine and white spruce seedlings on a 500-acre tract in northern Michigan during September. This is the beginning of the national reforestation project for Michigan.

These trees are expected to bring $140 an acre in 1978, if cut at that time. But many things may come about before 1978 to prevent the cutting or to change the value greatly from this estimate. At the present rate of deforestation, as reported from many sources, these trees will be priceless, almost curios, by 1978, if kept that long. On the other hand it is almost certain that necessity will drive the national government to reforest millions of acres and keep or return lumber prices to something like their present level. Thus, it is possible that this forest preserve in 1978 will be just another place to reap a harvest of half-century old trees. There are many possibilities behind this movement.

Ahead of all these possibilities lies the one great and significant fact that the federal government has planted the trees and thus revealed by action that it has determined that the forests of the nation shall not pass without a struggle to save them. That this struggle shall be successful there can be no reason to doubt. We particularly envy our great and sister state to the north for her good fortune in being chosen for this progressive work.

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